MCA CHULA VISTA AMPHITHEATER
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TECHNICAL APPENDICES

# Environmental Impact Report

# MCA CHULA VISTA AMPHITHEATER

## SCH# 95031073

Prepared for:

CITY OF CHULA VISTA

August 1995

Prepared by:

TETRA TECH, INC.

APPENDIX A

NOTICE OF PREPARATION AND RESPONSES

# TECHNICAL APPENDICES

# ENVIRONMENTAL IMPACT REPORT

# MCA CHULA VISTA AMPHITHEATER
SCH # 95031073

**Prepared for:**

**CITY OF CHULA VISTA**
**276 Fourth Avenue**
**Chula Vista, California 92121**

**Contact:**
**Joseph Monaco, AICP**
**Environmental Projects Manager**

**Prepared by:**

**TETRA TECH INCORPORATED**
**565 Pearl Street, Suite 200**
**La Jolla, California 92037**

**Contact:**
**Betty Dehoney**
**Environmental Services Manager**

**August 1995**

## Notice of Preparation

To: Distribution List

Subject: Notice of Preparation of a Draft Environmental Impact Report

| **Lead Agency:** | **Consulting Firm:** |
|---|---|
| Agency Name: City of Chula Vista | Firm Name: Tetra Tech, Inc. |
| Street Address: 276 Fourth Avenue | Street Address: 6405 Mira Mesa Blvd., Ste 100 |
| City/State/Zip: Chula Vista, CA 91910 | City/State/Zip: San Diego, CA 92121 |
| Contact: Joe Monaco | Contact: Betty Dehoney |

The City of Chula Vista will be the Lead Agency and will prepare an Environmental Impact Report for the project identified below. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by the City when considering your permit or other approval for the project.

The project description, location, and the potential environmental effects are contained in the attached materials. A copy of the Initial Study ☒ is ☐ is not attached.

Due to time limits mandated by State law, your response must be sent at the earliest possible date but ***not later than 30 days*** after receipt of this notice.

Please send your response to Joe Monaco, Environmental Projects Manager, at the address shown above. We will need the name of the contact person in your agency.

**Project Title:** MCA Chula Vista Amphitheater

**Project Location:** City of Chula Vista, County of San Diego

**Project Description:** 20,000 seat amphitheater (see Attachment A for more detail)

Date: March 22, 1995

Signature

Title: Environmental Projects Manager
Telephone: (619) 691-5016

March 21, 1995

# NOTICE OF PREPARATION
# OF A DRAFT ENVIRONMENTAL IMPACT REPORT

The City of Chula Vista publicly announces its intent to initiate the preparation of a Draft Environmental Impact Report (EIR) for the following project:

## MCA Chula Vista Amphitheater

The City of Chula Vista is the "Lead Agency" and will contract with a qualified consultant to prepare the Draft EIR so that all potential environmental impacts can be adequately addressed. Based on an Initial Study, it appears that the proposed project will create potentially significant, adverse environmental effects, including indirect and cumulative effects.

A detailed description of the project, as well as an explanation of potential environmental effects is provided in the Attachments to the Notice of Preparation (NOP). Please provide your written comments, including the specific statutory responsibilities of your agency, as applicable. Written comments must be received at the earliest possible date, but no later than 30 days after receipt of this notice. Comments and questions should be forwarded to:

Joe Monaco
Environmental Projects Manager
City of Chula Vista
Community Development Department
276 Fourth Avenue
Chula Vista, CA 91910
(619) 691-5016

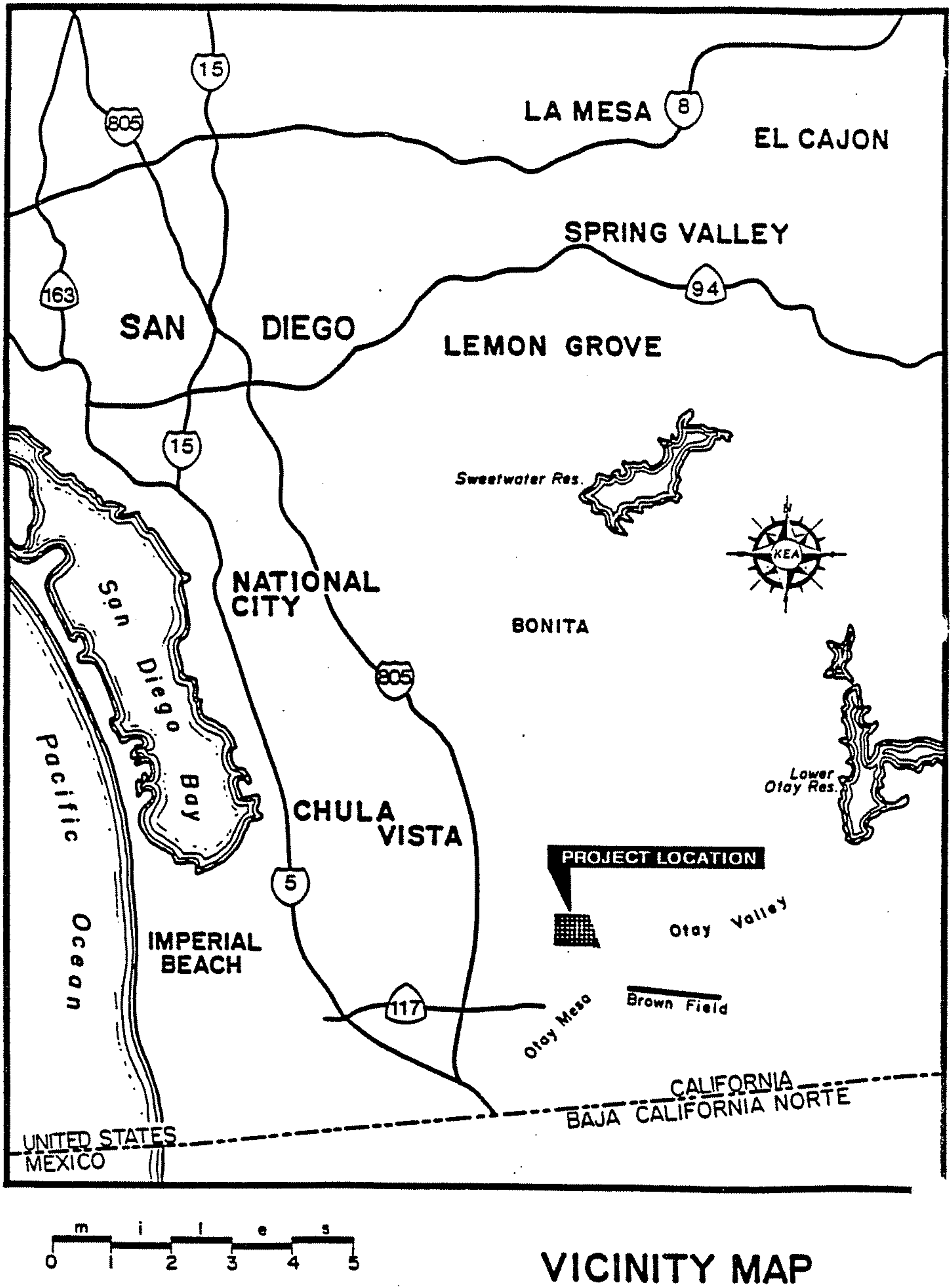
## Attachment A

### PROJECT DESCRIPTION

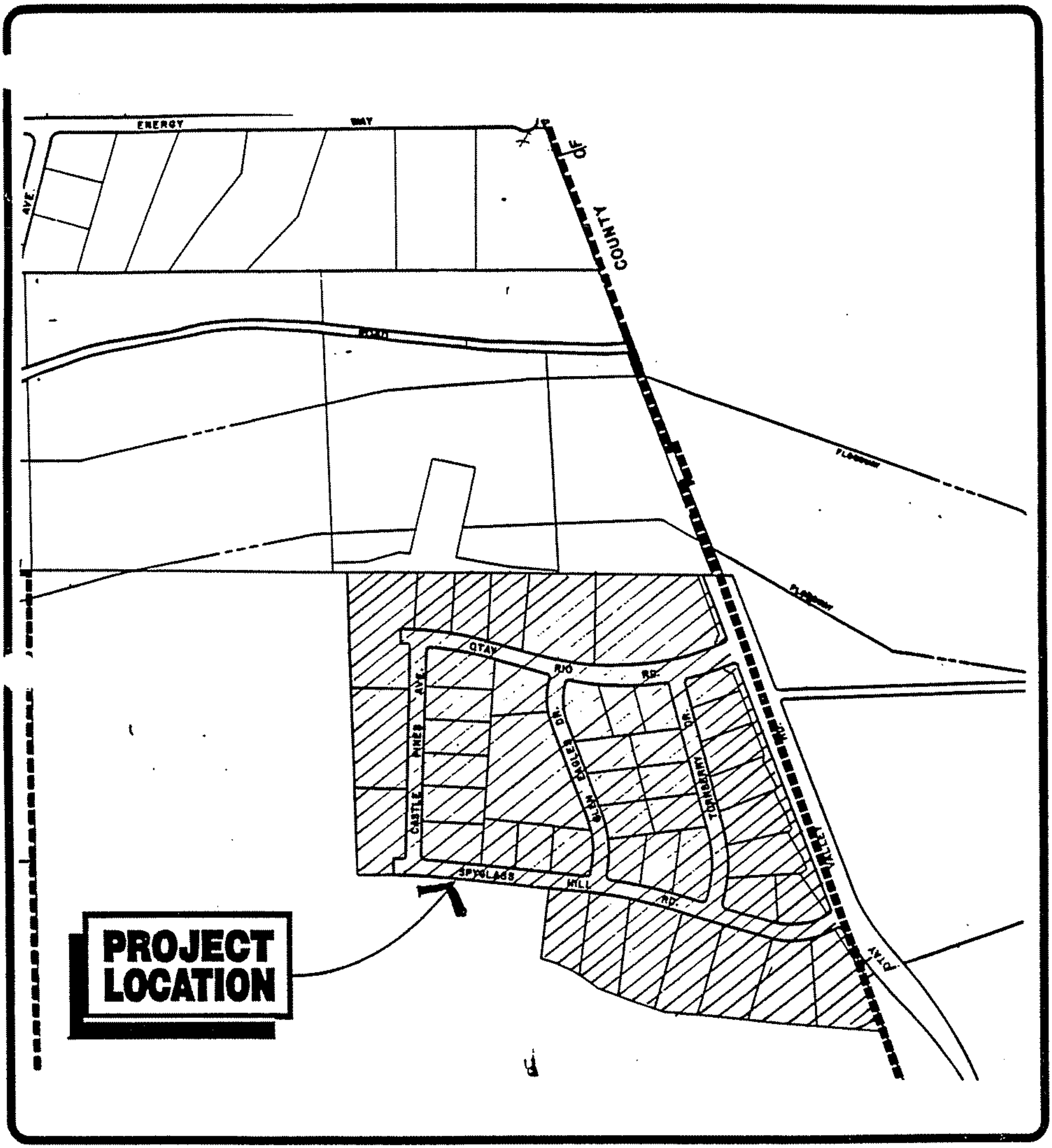
The proposed project involves construction of a 20,000 person capacity outdoor amphitheater, consisting of approximately 10,000 fixed seats and a grass berm to provide lawn seating for 10,000 patrons. The complex is proposed to include permanent concession, restroom and box office buildings and will require parking for approximately 6,000 cars. Structures are proposed to be approximately 125 feet high (100 feet above ground level). The amphitheater is proposed to be used for concert events approximately 35-60 nights per year. Additionally, an open air market is proposed for the parking lot area Thursday through Sunday from 7 am to 4 pm. The project will require night lighting onsite and along access roads. Fireworks may accompany select performances. The project will require grading to create an earthen bowl; all earthwork is proposed to be balanced onsite with no import or export of materials. The City has determined that the project may have one or more significant environmental effects and that an EIR is required.

### DISCRETIONARY ACTIONS

A Conditional Use Permit and Design Review are required.



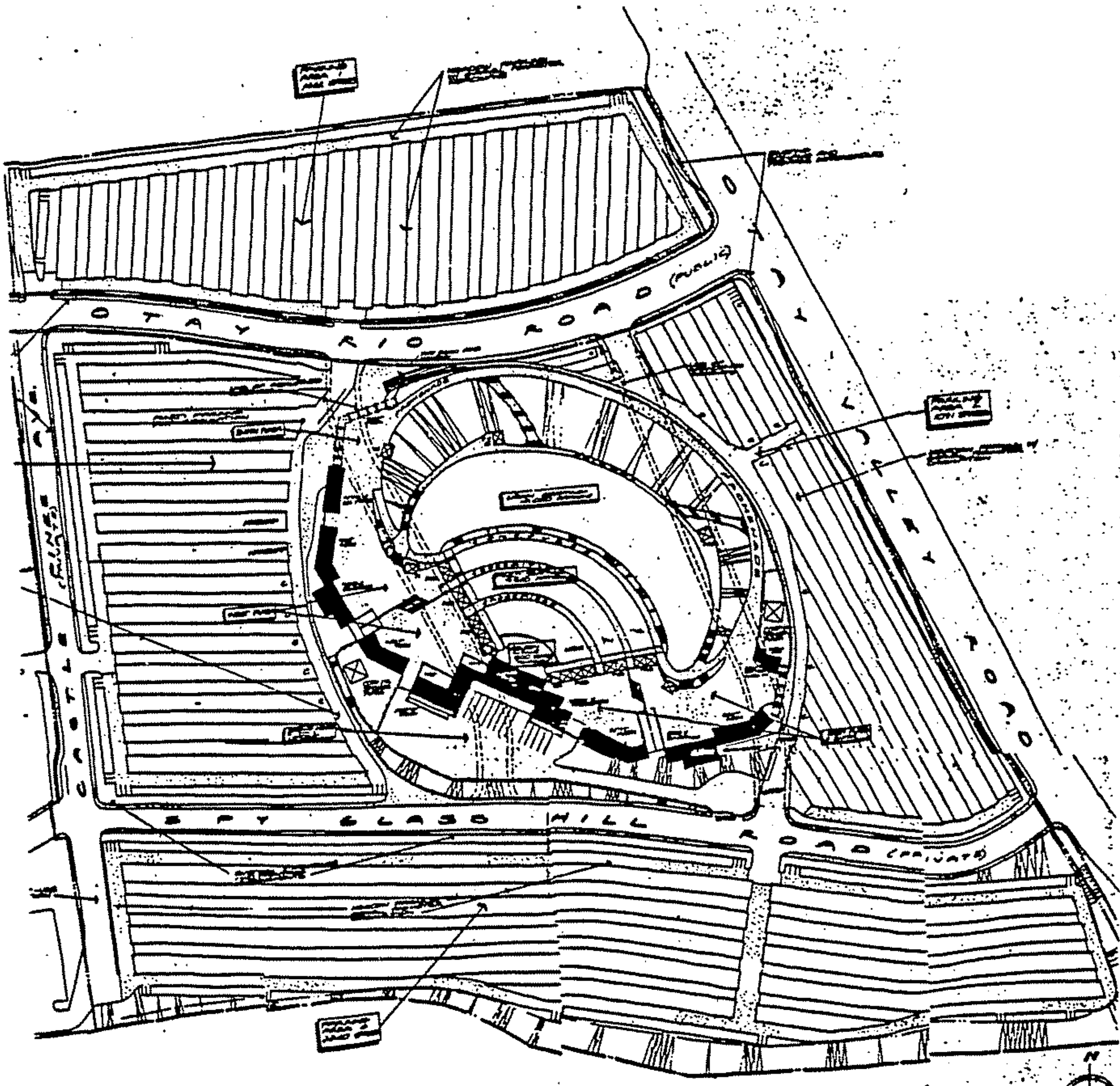

VICINITY MAP




# CHULA VISTA PLANNING DEPARTMENT

| LOCATOR | PROJECT APPLICANT: MCA Ampitheater | ENVIRONMENTAL IMPACT REPORT |
|---|---|---|
| NORTH | PROJECT ADDRESS: Otay Valley Road South of Otay River | **Request:** To construct an outdoor amphitheater with seating for approximately 20,000 spectators. |
| | SCALE: NO SCALE / FILE NUMBER: EIR - 95 - 03 | |

## ATTACHMENT B




**PROPOSED SITE PLAN**

Attachment C

# ENVIRONMENTAL CHECKLIST FORM

1. **Name of Proponent:** Bitterlin Starboard Development Partners

2. **Lead Agency Name and Address:** City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 91910

3. **Address/Phone Number of Proponent:** 1055 Shafter Street
San Diego, CA 92106
(619) 221-4400

4. **Name of Proposal:** MCA Chula Vista Amphitheater

5. **Date of Checklist:** March 21, 1995

## Environmental Impacts

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **I. LAND USE AND PLANNING.** *Would the proposal:* | | | | |
| a) Conflict with general plan designation or zoning? | ☐ | ☐ | ☐ | ☒ |
| b) Conflict with applicable environmental plans or policies adopted by agencies with jurisdiction over the project? | ☐ | ☐ | ☒ | ☐ |
| c) Affect agricultural resources or operations (e.g., impacts to soils or farmlands, or impacts from incompatible land uses)? | ☐ | ☐ | ☐ | ☒ |
| d) Disrupt or divide the physical arrangement of an established community (including a low-income or minority community)? | ☐ | ☐ | ☐ | ☒ |

Comments:
The EIR will evaluate the consistency of the project with existing General Plan Land use designations and other relevant General Plan issues, including; Land Use Element Goals/Objectives/Policies/Guidelines, Circulation Element designations, Public Facilities Growth Management Thresholds. Consistency with other related plans or policies, including those of the Otay Valley Regional Park will be addressed.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **II. POPULATION AND HOUSING.** *Would the proposal:* | | | | |
| a) Cumulatively exceed official regional or local population projections? | ☐ | ☐ | ☐ | ☒ |
| b) Induce substantial growth in an area either directly or indirectly (e.g., through projects in an undeveloped area or extension of major infrastructure)? | ☐ | ☒ | ☐ | ☐ |
| c) Displace existing housing, especially affordable housing? | ☐ | ☐ | ☐ | ☒ |

Comments:
The project does not involve the construction, displacement or relocation of housing.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **III. GEOPHYSICAL.** *Would the proposal result in or expose people to potential impacts involving:* | | | | |
| a) Unstable earth conditions or changes in geologic substructures? | ☐ | ☐ | ☒ | ☐ |
| b) Disruptions, displacements, compaction or overcovering of the soil? | ☐ | ☒ | ☐ | ☐ |
| c) Change in topography or ground surface relief features? | ☐ | ☒ | ☐ | ☐ |
| d) The destruction, covering or modification of any unique geologic or physical features? | ☐ | ☐ | ☐ | ☒ |
| e) Any increase in wind or water erosion of soils, either on or off the site? | ☐ | ☒ | ☐ | ☐ |
| f) Changes in deposition or erosion of beach sands, or changes in siltation, deposition or erosion which may modify the channel of a river or stream or the bed of the ocean or any bay inlet or lake? | ☐ | ☒ | ☐ | ☐ |
| g) Exposure of people or property to geologic hazards such as earthquakes, landslides, mud slides, ground failure, or similar hazards? | ☐ | ☒ | ☐ | ☐ |

Comments:
The EIR will address potential impacts associated with seismicity, soil suitability, landslides, erosion and subsidence.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **IV. WATER.** *Would the proposal result in:* | | | | |
| a) Changes in absorption rates, drainage patterns, or the rate and amount of surface runoff? | ☐ | ☐ | ☐ | ☒ |
| b) Exposure of people or property to water related hazards such as flooding or tidal waves? | ☐ | ☐ | ☐ | ☒ |
| c) Discharge into surface waters or other alteration of surface water quality (e.g., temperature, dissolved oxygen or turbidity)? | ☐ | ☐ | ☐ | ☒ |
| d) Changes in the amount of surface water in any water body? | ☐ | ☐ | ☐ | ☒ |
| e) Changes in currents, or the course of direction of water movements, in either marine or fresh waters? | ☐ | ☐ | ☒ | ☐ |
| f) Change in the quantity of ground waters, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations? | ☐ | ☐ | ☒ | ☐ |
| g) Altered direction or rate of flow of groundwater? | ☐ | ☐ | ☒ | ☐ |
| h) Impacts to groundwater quality? | ☐ | ☐ | ☒ | ☐ |
| i) Alterations to the course or flow of flood waters? | ☐ | ☐ | ☒ | ☐ |
| j) Substantial reduction in the amount of water otherwise available for public water supplies? | ☐ | ☐ | ☒ | ☐ |

Comments:
The EIR will address potential impacts associated with changes in absorption and redirection of runoff patterns, flooding (adjacent to the Otay River), water quality impacts from urban runoff, and changes in groundwater characteristics.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **V. AIR QUALITY.** *Would the proposal:* | | | | |
| a) Violate any air quality standard or contribute to an existing or projected air quality violation? | ☐ | ☐ | ☒ | ☐ |

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| b) Expose sensitive receptors to pollutants? | ☐ | ☐ | ☒ | ☐ |
| c) Alter air movement, moisture, or temperature, or cause any change in climate, either locally or regionally? | ☐ | ☐ | ☒ | ☐ |
| d) Create objectionable odors? | ☐ | ☐ | ☒ | ☐ |
| e) Create a substantial increase in stationary or non-stationary sources of air emissions or the deterioration of ambient air quality? | ☐ | ☐ | ☒ | ☐ |

Comments:
The EIR will analyze short term impacts including construction vehicle exhaust, dust and particulate generation, as well as long term impacts from operation of the land uses and vehicular traffic.

## VI. TRANSPORTATION/CIRCULATION.

*Would the proposal result in:*

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Increased vehicle trips or traffic congestion? | ☐ | ☒ | ☐ | ☐ |
| b) Hazards to safety from design features (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☒ | ☐ |
| c) Inadequate emergency access or access to nearby uses? | ☐ | ☒ | ☐ | ☐ |
| d) Insufficient parking capacity on-site or off-site? | ☐ | ☐ | ☒ | ☐ |
| e) Hazards or barriers for pedestrians or bicyclists? | ☐ | ☐ | ☒ | ☐ |
| f) Conflicts with adopted policies supporting alternative transportation (e.g. bus turnouts, bicycle racks)? | ☐ | ☐ | ☒ | ☐ |
| g) Rail, waterborne or air traffic impacts? | ☐ | ☐ | ☒ | ☐ |
| h) A "large project" under the Congestion Management Program? (An equivalent of 2400 or more average daily vehicle trips or 200 or more peak-hour vehicle trips.) | ☐ | ☒ | ☐ | ☐ |

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

Comments:
The EIR will contain an analysis of increased vehicular movement and parking requirements, including necessary circulation improvements. The analysis will be based on a traffic study for the project.

## VII. BIOLOGICAL RESOURCES. *Would the proposal result in impacts to:*

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Endangered, sensitive species, species of concern or species that are candidates for listing? | ☐ | ☒ | ☐ | ☐ |
| b) Locally designated species (e.g., heritage trees)? | ☐ | ☐ | ☒ | ☐ |
| c) Locally designated natural communities (e.g, oak forest, coastal habitat, etc.)? | ☐ | ☐ | ☒ | ☐ |
| d) Wetland habitat (e.g., marsh, riparian and vernal pool)? | ☐ | ☒ | ☐ | ☐ |
| e) Wildlife dispersal or migration corridors? | ☐ | ☐ | ☒ | ☐ |
| f) Affect regional habitat preservation planning efforts? | ☐ | ☐ | ☒ | ☐ |

Comments:
An analysis of direct and indirect impacts to biological resources will be included in the EIR. This analysis will be based on a biology study conducted as a part of the EIR.

## VIII. ENERGY AND MINERAL RESOURCES. *Would the proposal:*

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) Conflict with adopted energy conservation plans? | ☐ | ☐ | ☒ | ☐ |
| b) Use non-renewable resources in a wasteful and inefficient manner? | ☐ | ☐ | ☒ | ☐ |
| c) If the site is designated for mineral resource protection, will this project impact this protection? | ☐ | ☐ | ☒ | ☐ |

Comments: Energy efficient design requirements will be discussed in the EIR.

## IX. HAZARDS. *Would the proposal involve:*

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| a) A risk of accidental explosion or release of hazardous substances (including, but not limited to: petroleum products, pesticides, chemicals or radiation)? | ☐ | ☐ | ☒ | ☐ |

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| b) Possible interference with an emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☒ | ☐ |
| c) The creation of any health hazard or potential health hazard? | ☐ | ☐ | ☒ | ☐ |
| d) Exposure of people to existing sources of potential health hazards? | ☐ | ☐ | ☒ | ☐ |
| e) Increased fire hazard in areas with flammable brush, grass, or trees? | ☐ | ☐ | ☒ | ☐ |

Comments:
Contaminated soils have been removed from the site and stockpiled on the adjacent site. If these soils are to be used by the applicant, the EIR will address remediation needs.

**X. NOISE.** *Would the proposal result in:*

| | | | | |
|---|---|---|---|---|
| a) Increases in existing noise levels? | ☒ | ☐ | ☐ | ☐ |
| b) Exposure of people to severe noise levels? | ☐ | ☒ | ☐ | ☐ |

Comments:

A noise study is being prepared for the purposes of determining amphitheater facility design and protection of sensitive receptors in the project vicinity. The EIR shall objectively evaluate the noise study and provide a complete analysis of project impacts (including traffic impacts from both the amphitheater and the public works yard), mitigation measures and level of impact after mitigation.

**XI. PUBLIC SERVICES.** *Would the proposal have an effect upon, or result in a need for new or altered government services in any of the following areas:*

| | | | | |
|---|---|---|---|---|
| a) Fire protection? | ☐ | ☐ | ☒ | ☐ |
| b) Police protection? | ☐ | ☐ | ☒ | ☐ |
| c) Schools? | ☐ | ☐ | ☒ | ☐ |
| d) Maintenance of public facilities, including roads? | ☐ | ☐ | ☒ | ☐ |
| e) Other governmental services? | ☐ | ☐ | ☒ | ☐ |

Comments: The EIR will address potential impacts to governmental services.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **XII. UTILITIES AND SERVICE SYSTEMS.** *Would the proposal result in a need for new systems, or substantial alterations to the following utilities:* | | | | |
| a) Power or natural gas? | ☐ | ☐ | ☒ | ☐ |
| b) Communications systems? | ☐ | ☐ | ☒ | ☐ |
| c) Local or regional water treatment or distribution facilities? | ☐ | ☐ | ☒ | ☐ |
| d) Sewer or septic tanks? | ☐ | ☐ | ☒ | ☐ |
| e) Storm water drainage? | ☐ | ☐ | ☒ | ☐ |
| f) Solid waste disposal? | ☐ | ☐ | ☒ | ☐ |

Comments:
The EIR will address potential impacts to utility systems.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIII. AESTHETICS.** *Would the proposal:* | | | | |
| a) Obstruct any scenic vista or view open to the public or will the proposal result in the creation of an aesthetically offensive site open to public view? | ☐ | ☒ | ☐ | ☐ |
| b) Cause the destruction or modification of a scenic route? | ☐ | ☐ | ☒ | ☐ |
| c) Have a demonstrable negative aesthetic effect? | ☐ | ☐ | ☒ | ☐ |
| d) Create added light or glare sources that could increase the level of sky glow in an area or cause this project to fail to comply with Section 19.66.100 of the Chula Vista Municipal Code, Title 19? | ☐ | ☒ | ☐ | ☐ |
| e) Produce an additional amount of spill light? | ☐ | ☒ | ☐ | ☐ |

Comments:
The project will require grading to create a theater bowl and building pads, placement of structures and building, stage and theater lighting. The EIR shall address impacts associated with landform alteration, views, aesthetics and light and glare.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **XIV. CULTURAL RESOURCES.** *Would the proposal:* | | | | |
| a) Will the proposal result in the alteration of or the destruction or a prehistoric or historic archaeological site? | ☐ | ☐ | ☐ | ☒ |
| b) Will the proposal result in adverse physical or aesthetic effects to a prehistoric or historic building, structure or object? | ☐ | ☐ | ☐ | ☒ |
| c) Does the proposal have the potential to cause a physical change which would affect unique ethnic cultural values? | ☐ | ☐ | ☐ | ☒ |
| d) Will the proposal restrict existing religious or sacred uses within the potential impact area? | ☐ | ☐ | ☐ | ☒ |
| e) Is the area identified on the City's General Plan EIR as an area of high potential for archeological resources? | ☐ | ☐ | ☐ | ☒ |
| **XV. PALEONTOLOGICAL RESOURCES.** *Will the proposal result in the alteration of or the destruction of paleontological resources?* | ☐ | ☐ | ☒ | ☐ |

Comments:
Archaeological, paleontological and historical resources were evaluated in the EIR prepared for the Otay Rio Business Park. The EIR shall make reference to previous studies and render conclusions based on that information with respect to the proposed project.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **XVI. RECREATION.** *Would the proposal:* | | | | |
| a) Increase the demand for neighborhood or regional parks or other recreational facilities? | ☐ | ☐ | ☒ | ☐ |
| b) Affect existing recreational opportunities? | ☐ | ☐ | ☒ | ☐ |
| c) Interfere with recreation parks & recreation plans or programs? | ☐ | ☒ | ☐ | ☐ |

Comments:
The EIR will evaluate potential impacts related to the project's proximity to the proposed Otay Valley Regional Park.

| | Potentially Significant Impact | Potentially Significant Unless Mitigated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| **XVII. MANDATORY FINDINGS OF SIGNIFICANCE:** *See Negative Declaration for mandatory findings of significance. If an EIR is needed, this section should be completed.* | | | | |
| a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods or California history or prehistory? | ☐ | ☒ | ☐ | ☐ |
| b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.) | ☐ | ☒ | ☐ | ☐ |
| c) Does the project have environmental effect which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☒ | ☐ | ☐ |

## ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Potentially Significant Unless Mitigated," as indicated by the checklist on the following pages.

| | | |
|---|---|---|
| ☐ Land Use and Planning | ■ Transportation/Circulation | ☐ Public Services |
| ■ Population and Housing | ■ Biological Resources | ☐ Utilities and Service Systems |
| ■ Geophysical | ☐ Energy and Mineral Resources | ■ Aesthetics |
| ■ Water | ☐ Hazards | ☐ Cultural Resources |
| ☐ Air Quality | ■ Noise | ■ Recreation |
| | ■ Mandatory Findings of Significance | |

**DETERMINATION:**

On the basis of this initial evaluation:

I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on an attached sheet have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared. ☐

I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ■

I find that the proposed project MAY have a significant effect(s) on the environment, but at least one effect: 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets, if the effect is a "potentially significant impacts" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ☐

Signature          Date 3/22/95

Environmental Review Coordinator
City of Chula Vista

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

May 25, 1995

Mr. Joe Monaco
City of Chula Vista
Community Development Department
276 Fourth Avenue
Chula Vista, CA 91910

Re: Notice of Intent to Prepare a Draft Environmental Impact Report for the MCA Chula Vista Amphitheater, Chula Vista, San Diego County, California

Dear Mr. Monaco:

The U.S. Fish and Wildlife Service (Service) has reviewed the referenced Notice of Preparation (NOP) dated March 22, 1995, regarding the referenced project. The proposed project includes the construction of a 20,000 person capacity outdoor amphitheater consisting of approximately 10,000 fixed seats and a grass area to accomodate those wishing to sit on the lawn. The complex will also include permanent structures such as concession stands, box offices, restrooms, and a 6,000 car capacity parking lot. The project site is located in the City of Chula Vista (City), San Diego County.

The Service concurs with the City that the proposed project may have the potential for significant environmental impacts to biological resources. The primary concern and mandate of the Service is the protection of public fish and wildlife resources and their habitats. Our mandates further require that we provide comments on any public notices issued for a Federal permit or license affecting the nation's waters (e.g., Clean Water Act, Section 404 and River and Harbor Act of 1899, Section 10). The Service is also responsible for administering the Endangered Species Act of 1973 as amended (Act). Section 7 of the Act requires Federal agencies to consult with the Service should it be determined that their discretionary acts may affect a listed threatened or endangered species. Section 9 of the Act prohibits the "take" (e.g., harm, harassment, pursue, injure, kill) of Federally listed wildlife species. "Harm" (i.e., "take") is further defined to include habitat modification or degradation where it kills or injures wildlife by impairing essential behavioral patterns including breeding, feeding, or sheltering. "Take" can only be permitted pursuant to the pertinent language and provisions in Section 7 (Federal consultations) and Section 10(a) or conditioned through a special rule under section 4(d) of the Act.

The State of California has initiated a Natural Community Conservation Planning (NCCP) program. Coastal sage scrub is the first natural community to be planned for under the NCCP program. We recommend that the City ensure that the development of this and other projects do not preclude long-term preserve planning options and that they conform with other requirements of the NCCP program. Jurisdictions participating in the NCCP program should assess specific projects for consistency with the NCCP Conservation Guidelines.

The Service offers the following specific information and recommendations to assist you in planning for the preservation of sensitive wildlife species and habitat within the project area and as a means to assist you in complying with pertinent Federal statutes. In order to facilitate the evaluation of the proposed project from the standpoint of fish and wildlife protection, we request that the Draft Environmental Impact Report contain the following specific information:

1) A complete discussion of the purpose and need for the project or each of the project alternatives.

2) A complete description of the proposed project, including all practicable alternatives that have been considered to reduce project impacts to wetland areas, other sensitive habitat types, and fish and wildlife resources.

3) Specific acreage and descriptions of the types of wetland, coastal sage scrub, and other sensitive habitats that will or may be affected by the proposed project or project alternatives. Maps and tables should be used to summarize such information.

4) Descriptions of the biological resources associated with each habitat type. These descriptions should include both qualitative and quantitative assessments of the resources present on the proposed project site and alternative sites.

5) An assessment of direct, indirect, and cumulative project impacts to fish and wildlife and associated habitats. All facets of the project should be included in this assessment.

6) A list of Federal candidate, proposed or listed species, state-listed species, and locally sensitive species that are on or near the project site. A detailed discussion of these species, including information pertaining to their local status and distribution, should be included in this report. The anticipated or real impacts of the project on these species should be addressed fully. The Service is particularly interested in any and all pertinent information and data pertaining to potential or real impacts to: a) currently listed species including the southwestern arroyo toad (Bufo microscaphus californicus), coastal California gnatcatcher, Riverside fairy shrimp (Streptocephalus woottoni), San Diego button celery (Eryngium aristulatum var. parishii), California Orcutt grass (Orcuttia californica), Otay mesa mint (Pogogyne nudiuscula), southwestern willow flycatcher (Empidonax traillii extimus), and the least Bell's vireo (Vireo belli pusillus); b) raptors; c) sensitive plant species including short-leaved Dudleya (Dudleya blochmaniae ssp. brevifolia), Otay tarweed (Hemizonia conjugens), San Diego ragweed (Ambrosia pumila), Orcutt's bird's

beak (Cordylanthus orcuttianus), Orcutt's brodiaea (Brodiaea orcuttii), summer holly (Comarostaphylis diversifolia), and the southern spikeweed (Hemizonia australis); d) all species proposed for listing including the California red-legged frog (Rana aurora draytoni), San Diego fairy shrimp (Branchinecta sandiegensis), and the Quino checkerspot butterfly (Euphydryas editha quino); and e) Federal candidates for listing, including the mountain plover (Charadrius montanus), California horned lark (Eremophila alpestris actia), ferruginous hawk (Buteo regalis), southwestern pond turtle (Clemmys marmorata pallida), Dulzura California pocket mouse (Perognathus [chaetodipus] californicus femoralis), greater western mastiff-bat (Eumops perotis californicus), Mexican long-tongued bat (Choenycteris mexicana), and the coastal rosy boa (Lichanura trivirgata rosafusca). If proposed candidate species are subsequently listed as threatened or endangered, the publishing of the final rule designating official listing could occur during the course of the planning or implementation phases of the various proposed project activities.

7) Specific mitigation plans to fully offset project-related impacts, including proposals for mitigating the cumulative impacts of direct and indirect habitat loss, degradation, or modification. Adverse project-related impacts should be mitigated through the preservation, re-creation, or revegetation of impacted habitat types.

8) An analysis of the effects of the project on the hydrology of any and all riparian or wetland communities within the sphere of influence of the project. Of particular importance is an analysis of the adequacy of proposed means to convey major flood or runoff flows without impacting vegetation off-site or in the restoration area.

9) Identification of methods to be employed to prevent soil erosion and siltation of habitats off-site.

10) Measures to be taken to perpetually protect the habitat value of proposed mitigation. Issues that should be addressed include restrictions on vehicle and people access, proposed land dedications, monitoring and management programs, control of illegal dumping, restrictions on lighting near mitigation areas, etc.

11) A thorough analysis of expected noise impacts on avian species and measures to be taken to mitigate any adverse impacts resulting from increased noise levels.

12) A complete discussion of the consistency of the subject project with the NCCP program and the Multiple Species Conservation Plan.

The Service thanks you for the opportunity to comment on the referenced NOP and looks forward to working with the City of Chula Vista. If you should have any questions pertaining to these comments, please contact Shawnetta Grandberry at (619)-431-9440.

Sincerely,

for Gail C. Kobetich
Field Supervisor

#1-6-95-HC-218
cc: CDFG, San Diego, CA (Attn: Bill Tippets)

STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, *Governor*

DEPARTMENT OF FISH AND GAME
GOLDEN SHORE, SUITE 50
.G BEACH, CA 90802
(310) 590-5113

April 19, 1995

Mr. Joe Monaco
Environmental Projects Manager
City of Chula Vista
Community Development Department
276 Fourth Avnue
Chula Vista, California 91910

Dear Mr. Monaco:

**Notice of Preparation of Draft Environmental Impact Report**
**MCA Chula Vista Amphitheater**

The Department of Fish and Game (Department) appreciates this opportunity to comment on the above-referenced project, relative to impacts to biological resources. To enable Department staff to adequately review and comment on the proposed project, we recommend the following information be included in the Draft Environmental Impact Report:

1. A complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, and locally unique species and sensitive habitats.

   a. A thorough assessment of rare plants and rare natural communities, following the Department's May 1984 Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities (Attachment 1).

   b. A complete assessment of sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service.

   c. Rare, threatened, and endangered species to be addressed should include all those which meet the California Environmental Quality Act (CEQA) definition (see CEQA Guidelines, §15380).

d. The Department's California Natural Diversity Data Base in Sacramento should be contacted at (916) 327-5960 to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.

2. A thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts.

a. CEQA Guidelines, §15125(a), direct that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region.

b. Project impacts should be analyzed relative to their effects on off-site habitats. Specifically, this should include nearby public lands, open space, adjacent natural habitats, and riparian ecosystems. Impacts to and maintenance of wildlife corridor/movement areas, including access to undisturbed habitat in adjacent areas, should be fully evaluated and provided.

c. A cumulative effects analysis should be developed as described under CEQA Guidelines, §15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

d. The document should include an analysis of the effect that the project may have on completion and implementation of regional and/or subregional conservation programs. Under §2800-§2840 of the Fish and Game Code, the Department, through the Natural Communities Conservation Planning (NCCP) program, is coordinating with local jurisdictions, landowners, and the Federal Government to preserve local and regional biological diversity. Coastal sage scrub is the first natural community to be planned for under the NCCP program. The Department recommends that the County ensure that the development of this and other proposed projects do not preclude long-term preserve planning options and that projects conform with other requirements of the NCCP program. Jurisdictions participating in the NCCP should assess specific projects for consistency with the NCCP Conservation Guidelines. Additionally, the jurisdictions should quantify and qualify: 1) the amount of coastal sage scrub within their boundaries; 2) the acreage of coastal sage scrub habitat removed by individual projects; and 3) any acreage set aside for mitigation. This information should be kept in an updated ledger system. These issues must be addressed in an Environmental Impact Report per CEQA Guidelines, §15065 and §15380.

3. A range of alternatives should be analyzed to ensure that alternatives to the proposed project are fully considered and evaluated. A range of alternatives which avoid or otherwise minimize impacts to sensitive biological resources should be included. Specific alternative locations should also be evaluated in areas with lower resource sensitivity where appropriate.

   a. Mitigation measures for project impacts to sensitive plants, animals, and habitats should emphasize evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Off-site compensation for unavoidable impacts through acquisition and protection of high-quality habitat elsewhere should be addressed.

   b. The Department considers Rare Natural Communities as threatened habitats having both regional and local significance. Thus, these communities should be fully avoided and otherwise protected from project-related impacts (Attachment 2).

   c. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Department studies have shown that these efforts are experimental in nature and largely unsuccessful.

4. If the project has the potential to adversely affect species of plants or animals listed under the California Endangered Species Act (CESA), either during construction or over the life of the project, a CESA-Memorandum of Understanding (CESA-MOU) must be obtained under §2081 of the Fish and Game Code. CESA-MOU's are issued to conserve, protect, enhance, and restore State-listed threatened or endangered species and their habitats. Early consultation is encouraged, as significant modification to a project and mitigation measures may be required in order to obtain a CESA-MOU.

   a. Biological mitigation proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA-MOU.

   b. A Department-approved Mitigation Agreement and Mitigation Plan are required for plants listed as rare under the Native Plant Protection Act.

5. The Department opposes the elimination of watercourses and/or their channelization or conversion to subsurface drains. All wetlands and watercourses, whether intermittent or perennial, must be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations.

a. The Department has direct authority under Fish and Game Code §1600 et. seq. in regard to any proposed activity which would divert, obstruct, or affect the natural flow or change the bed, channel, or bank of any river, stream, or lake. Departmental jurisdiction under §1600 et. seq. applies to all lands within the 100-year floodplain. Early consultation is recommended, since modification of the proposed project may be required to avoid or reduce impacts to fish and wildlife resources.

b. A discussion of potential adverse impacts from any increased runoff, sedimentation, soil erosion, and/or urban pollutants on streams and watercourses on or near the project site, with mitigation measures proposed to alleviate such impacts must be included.

The Department holds regularly scheduled pre-project planning/early consultation meetings. To make an appointment, please call our regional office at (310) 590-5137.

Thank you for this opportunity to comment. Questions regarding this letter and further coordination on these issues should be directed to Mr. Randy Botta, Wildlife Biologist, at (619) 675-0124.

Sincerely,

Patricia Wolf

Patricia Wolf
Acting Regional Manager
Region 5

Attachments

cc: See Attached List

cc: Mr. Tim Dillingham
Department of Fish and Game
San Diego, California

Mr. Randy Botta
Department of Fish and Game
San Diego, California

Mr. Jim Dice
Department of Fish and Game
Borrego Springs, California

Mr. Terry Foreman
Department of Fish and Game
San Diego, California

Ms. Terri Stewart
Department of Fish and Game
San Diego, California

Ms. Terri Dickerson
Department of Fish and Game
Laguna Hills, California

U.S. Fish and Wildlife Service
Carlsbad, California

U.S. Army Corps of Engineers
Los Angeles, California

State of California
THE RESOURCES AGENCY
Department of Fish and Game
May 4, 1984

# GUIDELINES FOR ASSESSING THE EFFECTS OF PROPOSED DEVELOPMENTS ON RARE AND ENDANGERED PLANTS AND PLANT COMMUNITIES

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how field surveys should be conducted and what information should be contained in the survey report.

1. Botanical surveys that are conducted to determine the environmental effects of a proposed development should be directed to all rare and endangered plants and plant communities. Rare and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare and/or endangered under the following definitions.

   A species, subspecies or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition or disease. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

   Rare plant communities are those communities that are of highly limited distribution. These communities may or may not contain rare or endangered species. The most current version of the California Natural Diversity Data Base's Outline of Terrestrial Communities in California may be used as a guide to the names of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or the extent that, rare plants will be affected by a proposed project when:

   a. Based on an initial biological assessment, it appears that the project may damage potential rare plant habitat;

   b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking; or

   c. No initial biological assessment has been conducted and it is unknown whether or not rare plants or their habitat exist on the site.

3. Botanical consultants should be selected on the basis of possession of the following qualifications (in order of importance):

   a. Experience as a botanical field investigator with experience in field sampling design and field methods;

   b. Taxonomic experience and a knowledge of plant ecology;

   c. Familiarity with the plants of the area, including rare species; and

   d. Familiarity with the appropriate state and federal statutes related to rare plants and plant collecting.

4. Field surveys should be conducted in a manner that will locate any rare or endangered species that may be present. Specifically, rare or endangered plant surveys should be:

   a. Conducted at the proper time of year when rare or endangered species are both "evident" and identifiable. Field surveys should be scheduled (1) to coincide with known flowering periods, and/or (2) during periods of phenological development that are necessary to identify the plant species of concern.

b. Floristic in nature. "Predictive surveys" (which predict the occurrence of rare species based on the occurrence of habitat or other physical features rather than actual field inspection) should be reserved for ecological studies, not for impact assessment. Every species noted in the field should be identified to the extent necessary to determine whether it is rare or endangered.

c. Conducted in a manner that is consistent with conservation ethics. Collections of rare or suspected rare species (voucher specimens) should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit regulations. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.

e. Well documented. When a rare or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form should be completed and submitted to the Natural Diversity Data Base.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations, EIR's and EIS's, and should contain the following information:

a. Project description, including a detailed map of the project location and study area.

b. A written description of biological setting referencing the community nomenclature used and a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys.

e. Results of survey (including detailed maps).

f. An assessment of potential impacts.

g. Discussion of the importance of rare plant populations with consideration of nearby populations and total species distribution.

h. Recommended mitigation measures to reduce or avoid impacts.

i. List of all species identified.

j. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.

k. Name of field investigator(s).

l. References cited, persons contacted, herbaria visited, and disposition of voucher specimens.

ATTACHMENT 2

## Sensitivity of Top Priority Rare Natural Communities in Southern California*

Sensitivity rankings are determined by the Department of Fish and Game, California Natural Diversity Data Base and based on either number of known occurrences (locations) and/or amount of habitat remaining (acreage). The three rankings used for these top priority rare natural communities are as follows:

S1.- Less than 6 known locations and/or on less than 2,000 acres of habitat remaining

S2.- Occurs in 6-20 known locations and/or 2,000-10,000 acres of habitat remaining

S3.- Occurs in 21-100 known locations and/or 10,000-50,000 acres of habitat remaining

The number to the right of the decimal point after the ranking refers to the degree of threat posed to that natural community regardless of the rank. For example:

S1.1 = very threatened
S2.2 = threatened
S3.3 = no current threats known

### Sensitivity Rankings (February 1992)

| Rank | Community Name | |
|---|---|---|
| S1.1 | Mojave Riparian Forest | Southern Dune Scrub |
| | Sonoran Cottonwood Willow Riparian | Southern Coastal Bluff Scrub |
| | Mesquite Bosque | Maritime Succulent Scrub |
| | Elephant Tree Woodland | Riversidean Alluvial Fan Sage Scrub |
| | Crucifixion Thorn Woodland | Southern Maritime Chaparral |
| | Allthorn Woodland | Valley Needlegrass Grassland |
| | Arizonan Woodland | Great Basin Grassland |
| | Southern California Walnut Forest | Mojave Desert Grassland |
| | Mainland Cherry Forest | Pebble Plains |
| | Southern Bishop Pine Forest | Southern Sedge Bog |
| | Torrey Pine Forest | Cismontane Alkali Marsh |
| | Desert Mountain White Fir Forest | |

## Sensitivity Rankings (Cont.)

### Community Name

.2 Southern Foredunes
Mono Pumice Flat
Southern Interior Basalt Fl. Vernal Pool

.1 Venturan Coastal Sage Scrub
Diegan Coastal Sage Scrub
Riversidean Upland Coastal Sage Scrub
Riversidean Desert Sage Scrub
Sagebrush Steppe
Desert Sink Scrub
Mafic Southern Mixed Chaparrel
San Diego Mesa Hardpan Vernal P.
San Diego Mesa Claypan Vernal P.
Alkali Meadow
Southern Coastal Salt Marsh
Coastal Brackish Marsh
Transmontane Alkali Marsh

Coastal and Valley Freshwater Marsh
S. Arroya Willow Riparian Forest
Southern Willow Scrub

Modoc-G.Bas. Cottonwood Willow Rip.
Modoc-Great Basin Riparian Scrub
Mojave Desert Wash Scrub
Engelmann Oak Woodland
Open Engelmann Oak Woodland
Closed Engelmann Oak Woodland
Island Oak Woodland
California Walnut Woodland
Island Ironwood Forest
Island Cherry Forest
S. Interior Cypress Forest
Bigcone Spruce-Canyon Oak Forest

2.2 Active Coastal Dunes
Active Desert Dunes
Stab. and Part. Stab. Desert Dunes
Stab. and Part. Stab. Desert Sandfield
Mojave Mixed Steppe
Transmontane Freshwater Marsh
Coulter Pine Forest
S. California Fellfield
White Mountains Fellfield

S2.3 Bristlecone Pine Forest
Limber Pine Forest

# ELEMENT RANKING

## GLOBAL RANKING

The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

**SPECIES LEVEL**

G1 = Less than 6 viable EOs OR less than 1000 individuals OR less than 2000 acres.
G2 = 6-20 EOs OR 1000-3000 individuals OR 2000-10,000 acres.
G3 = 21-100 EOs OR 3000-10,000 individuals OR 10,000-50,000 acres
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.
G5 = Population demonstrably secure to ineradicable due to being commonly found in the world.

**SUBSPECIES LEVEL**

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies.

For example: *Chorizanthe robusta* var. *hartwegii*. This plant is ranked G2T1. The G-rank refers to the whole species range of *Chorizanthe robusta*. The T-rank refers only to the global condition of var. *hartwegii*.

## STATE RANKING

The *state rank* is assigned much the same way as the global rank, except state ranks in California often also contain a threat number attached to the S-rank.

Less than 6 EOs OR less than 1000 individuals OR less than 2000 acres
= S1:
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

6-20 EOs OR 1000-3000 individuals OR 2000-10,000 acres
= S2:
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

21-100 EOs OR 3000-10,000 individuals OR 10,000-50,000 acres
= S3:
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; there is some threat, or somewhat narrow habitat. NO THREAT NUMBER.

S5 Demonstrably secure to ineradicable in California. NO THREAT NUMBER.

**Notes:**

Uncertainty about the rank of an element is expressed in two major ways:

By expressing the rank as a range of values: i.e. S2S3 means the rank is something between S2 and S3.

By adding a "?" to the rank: i.e. S2? This represents more certainty than S2S3.

**Other symbols:**

GH All sites are historical; the element has not been seen for at least 20 years but suitable habitat still exists (SH = All California sites are historical).
GX All sites are extirpated; this element is extinct in the wild (SX = All California sites are extirpated).
GXC Extinct in the wild; exists in cultivation.
G1Q The element is very rare, but there is a taxonomic question associated with it.

## Top Priority Rare Natural Communities From Region Five

| Code Number | Location[1] | Few Records[1] | Name |
|---|---|---|---|
| **S1.1 Rank:** | | | |
| 21330 | Cis | | Southern Dune Scrub |
| 31200 | Cis | | Southern Coastal Bluff Scrub |
| 32400 | Cis | | Maritime Succulent Scrub |
| 32720 | Cis | | Riversidean Alluvial Fan Sage Scrub |
| 37C30 | Cis | Y | Southern Maritime Chaparral |
| 42110 | Cis | | Valley Needlegrass Grassland |
| 43000 | Des | Y | Great Basin Grassland |
| 43777 | Des | Y | Mojave Desert Grassland |
| 47000 | Cis | | Pebble Plains |
| 51177 | Cis | Y | Southern Sedge Bog |
| 52310 | Cis | | Cismontane Alkali Marsh |
| 61700 | Des | | Mojave Riparian Forest |
| 61810 | Des | | Sonoran Cottonwood Willow Riparian |
| 61820 | Des | | Mesquite Bosque |
| '100 | Des | Y | Elephant Tree Woodland |
| .5200 | Des | Y | Crucifixion Thorn Woodland |
| 75300 | Des | Y | Allthorn Woodland |
| 75400 | Des | Y | Arizonan Woodland |
| 81600 | Cis | | Southern California Walnut Forest |
| 81820 | Cis | Y | Mainland Cherry Forest |
| 83122 | Cis | Y | Southern Bishop Pine Forest |
| 83140 | Cis | | Torrey Pine Forest |
| 85330 | Des | Y | Desert Mountain White Fir Forest |
| **S 1.2 Rank:** | | | |
| 21230 | Cis | | Southern Foredunes |
| 35410 | Des | | Mono Pumice Flat |
| 44310 | Cis | | Southern Interior Basalt Fl. Vernal Pool |
| **S2.1 Rank:** | | | |
| 32300 | Cis | Y | Venturan Coastal Sage Scrub |
| 32500 | Cis | | Diegan Coastal Sage Scrub |
| 32710 | Cis | Y | Riversidian Upland Coastal Sage Scr. |
| 32730 | Cis | Y | Riversidean Desert Sage Scrub |
| 35300 | Des | Y | Sagebrush Steppe |
| 36120 | Des | Y | Desert Sink Scrub |
| 37122 | Cis | Y | Mafic Southern Mixed Chaparral |
| 44321 | Cis | | San Diego Mesa Hardpan Vernal P. |
| 44322 | Cis | | San Diego Mesa Claypan Vernal P. |
| 45310 | Des | | Alkali Meadow |
| 52120 | Cis | | Southern Coastal Salt Marsh |
| 52320 | Cis | | Coastal Brackish Marsh |
| 52410 | Des | | Transmontane Alkali Marsh |

[1] coded as either cis (for cismontane) or des (for desert)

NDDB rare communities R-5 Feb. 1992
page 2

| Code Number | Location[1] | Few Records | Name |
|---|---|---|---|
| 52410 | Cis | | Coastal and Valley Freshwater Marsh |
| 61320 | Cis | | S. Arroyo Willow Riparian Forest |
| 63320 | Cis | | Southern Willow Scrub |
| 61610 | Des | | Modoc-G Bas Cottonwood Willow Rip. |
| 63600 | Des | Y | Modoc-Great Basin Riparian Scrub |
| 63700 | Des | Y | Mojave Desert Wash Scrub |
| 71160 | Cis | Y | Engelmann Oak Woodland |
| 71161 | Cis | Y | Open Engelmann Oak Woodland |
| 71182 | Cis | Y | Closed Engelmann Oak Woodland |
| 71190 | Cis | Y | Island Oak Woodland |
| 71210 | Cis | | California Walnut Woodland |
| 81700 | Cis | Y | Island Ironwood Forest |
| 81810 | Cis | | Island Cherry Forest |
| 83230 | Cis | | S. Interior Cypress Forest |
| 84150 | Cis | Y | Bigcone Spruce-Canyon Oak Forest |
| **S2.2 Rank:** | | | |
| 21100 | Cis | Y | Active Coastal Dunes |
| 22100 | Des | | Active Desert Dunes |
| 22200 | Des | | Stab. and Part. Stab. Desert Dunes |
| 22300 | Des | Y | Stab and Part. Stab. Desert Sandfield |
| 34220 | Des | Y | Mojave Mixed Steppe |
| 52420 | Des | Y | Transmontane Freshwater Marsh |
| 84140 | Cis | Y | Coulter Pine Forest |
| 91130 | Cis | Y | S. California Fellfield |
| 91140 | Des | Y | White Mountains Fellfield |
| **S2.3 Rank:** | | | |
| 86400 | Des | | Bristlecone Pine Forest |
| 86700 | Des | Y | Limber Pine Forest |

[1] coded as either cis (for cismontane) or des (for desert)

THE CITY OF
SAN DIEGO
CITY OPERATIONS BUILDING • 1222 First Avenue • M.S. 501 • San Diego, California 92101

OFFICE OF
DEVELOPMENT SERVICES
DEPARTMENT
236-6460

April 14, 1995

Mr. Joe Monaco
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 91910

Dear Mr. Monaco:

SUBJECT: RESPONSE TO THE NOP FOR THE MCA CHULA VISTA AMPHITHEATER PROJECT (DEP FILE 95-02)

This is the City of San Diego's response to the Notice of Preparation (NOP) for the proposed MCA Chula Vista Amphitheater.

We are very concerned that the project could have significant impacts on planned land uses in proximate portions of San Diego. The NOP indicates that the proposed project would pose no conflict with the General Plan designation or zoning. While this may be the case for the Chula Vista General Plan, we believe there will be potentially serious conflicts with land uses planned for areas to the south, west and east of the amphitheater within the City of San Diego. We are requesting that these land use issues be fully assessed in the EIR.

Two large adjacent areas that have been designated for residential use since the Otay Mesa Community Plan was adopted in 1981 are potentially significantly impacted by the proposed MCA project. These are the Dennery Ranch and Robinhood Ridge Precise Plans. Both of these Precise Plans along with accompanying tentative maps have been approved by the City of San Diego. Events planned for the proposed amphitheater would create ambient noise levels that could significantly impact approved residential development in portions of the Robinhood Ridge project. Additional sections of Robinhood Ridge and a part of Dennery Ranch would be affected by nuisance noise that would make it difficult to market housing in these areas.

The City of San Diego is particularly sensitive to the potential loss of future housing. Various factors have operated in recent years to reduce the amount of potential future housing anticipated in our city.

Potential conflicts also exist between the amphitheater and the draft Multiple Species Conservation Program (MSCP) open space preserve that the City is preparing in conjunction with other jurisdictions, including Chula Vista, and federal and state wildlife agencies. The draft MSCP, which was recently distributed for public review, identifies a "hardline" preserve for the portions within the City of San Diego. The project site lies immediately adjacent to an area identified by the draft MSCP Plan as the Multi-Habitat Planning Area (MHPH) for this portion of the Otay River Valley. The Plan restricts uses within the MHPA and provides development guidelines for uses within and adjacent to the MHPA. The EIR should thoroughly analyze impacts on wildlife movement corridors, and especially edge effects to adjacent sensitive biological resources. Of major concern is the loud noise and laser/strobe lights expected to emanate from the amphitheater which could adversely affect the sensitive wildlife that the MSCP preserve is intended to protect.

The proposed amphitheater also has potentially significant harmful impacts to the planned Otay Valley Regional Park. The City of San Diego has been working with Chula Vista and the County on plans for this regional park for several years. The EIR should fully evaluate the potential impact of this project on the proposed park.

Adequate environmental documentation for the project is of great importance to the City. Please place us on the distribution list for the draft EIR.

These conclude the City of San Diego's comments on the NOP. Please feel free to contact Doug McHenry at 236-7785 should you have any questions.

Sincerely,

Ann B. Hix

Ann B. Hix, Principal Planner
Environmental Analysis Section

ABH:DMM:lcw

cc: Meryl Balko, City Manager's Office
Tom Story, Planning Department
William Levin, Planning Department
Mike Stang, Planning Department
Jean Cameron, Development Services Department
Mary Ladiana, Development Services Department
Keith Greer, Development Services Department

LT[LCW]277

...Dedicated to Community Service
10595 JAMACHA BOULEVARD, SPRING VALLEY, CALIFORNIA 91977
TELEPHONE: 670-2222, AREA CODE 619

April 4, 1995

Mr. Joe Monaco
Environmental Projects Manager
City of Chula Vista
Community Development Department
276 Fourth Avenue
Chula Vista, CA 91910

**Re: MCA Chula Vista Amphitheater**
**Notice of Preparation (NOP)**
**(W.O./F.N. 8014//3830)**

Dear Joe:

I am pleased to announce that I am the new Environmental Specialist for the Otay Water District (OWD) and look forward to working with the City of Chula Vista on many projects.

OWD is pleased to respond to the City of Chula Vista's Notice of Preparation (NOP) for the MCA Chula Vista Amphitheater.

We understand that the City will prepare an Environmental Impact Report (EIR) for the project described as follows: The proposed project involves construction of a 20,000 person capacity outdoor amphitheater consisting of approximately 10,000 fixed seats and a grass berm to provide lawn seating for 10,000 patrons. We further understand the project site is located at the intersection of Otay Valley Road and Otay Rio Road in the City of Chula Vista.

The OWD will focus its comments with regard to water and reclaimed water concerns as follows:

a. All necessary water system easements must be obtained by the project applicant and conveyed to the District.

b. The proposed project must meet OWD water and reclaimed water facility requirements.

c. Landscaping irrigation systems should be developed for the use of reclaimed water.

d. The project should incorporate an on-site fire system.

e. The EIR should address fire flow demands and any impacts to existing OWD delivery capabilities. The proposed site plan indicates that the amphitheater will overlay existing

OWD mains currently located the length of the existing Glen Eagles Drive and Turnberry Drive. The EIR should address these impacts. If these A.C. pipes are to be removed they must be disposed of in a proper manner. The contractor should contact the District Inspection Department before any work is started as the District may want to salvage some appurtenances (fire hydrants, etc.).

f. Potential impacts to the 16" main in Otay Rio Road and/or the 16" main and connection with the City of San Diego facilities, located immediately south of the project site, should also be discussed in the EIR.

g. Consideration of the use of a private on-site water system to serve the interior of the project site should be evaluated.

Please contact me at 670-2293 if you need any further environmental information or have any questions.

Sincerely,

Michael F. Coleman

Michael F. Coleman, AICP
Environmental Specialist

MFC:cp

cc: Jim Peasley
John Garcia
Chris Craven
Rebecca Patton

Sweetwater Union High School District

ADMINISTRATION CENTER
1130 Fifth Avenue
Chula Vista, California 91911-2896
(619) 691-5500

**Division of Planning and Facilities**

March 27, 1995

Mr. Joe Monaco
City of Chula Vista
Building & Housing
276 Fourth Avenue
Chula Vista, CA 91910

Dear Mr. Monaco:

*Re: Application for an EIR - EIR-95-03*

The above project will have an impact on the Sweetwater Union High School District. Payment of school fees will be required pursuant to Government Code No. 65995 (Developer Fees) prior to issuance of building permit.

Sincerely,

Thomas Silva
Director of Planning

TS/ml

Sweetwater Union High School District

ADMINISTRATION CENTER
1130 Fifth Avenue
Chula Vista, California 91911-2896
(619) 691-5500

**Division of Planning and Facilities**

April 5, 1995

Mr. Joe Monaco
Community Development
City of Chula Vista
276 Fourth Avenue
Chula Vista, CA 91911

Dear Mr. Monaco:

Re: MCA Chula Vista Amphitheater

The Sweetwater Union High School District is in receipt of the Notice of Preparation of the Draft Environmental Impact Report for the proposed amphitheater.

The district and the City of Chula Vista are in discussions regarding the potential relocation of the district's warehouse, transportation and maintenance departments from Fifth Avenue to the property west of the proposed amphitheater. The Environmental Impact Report should make note of this. The district may be able to support evening use of the theater for forty to fifty nights per year at the exclusion of all other functions; i.e., swap meet. Daytime use will conflict with bus schedules, deliveries, and the ability to service school sites in a timely manner.

The volume of traffic anticipated for the theater events and the traffic of future land uses will require roadway improvements on the Otay Valley Road. Widening and upgrading the bridge may also be required. To help further alleviate potential conflicts, a secondary access road will be required west of the site.

I look forward to reviewing the draft report.

Sincerely,

Thomas Silva
Director of Planning

TS/ml

c: Betty Dehoney, Tetra Tech, Inc.

APR 1995
Received
Community Development
Department

# California Native Plant Society

SAN DIEGO CHAPTER
P.O. Box 1390, San Diego, CA 92112



April 6, 1995

Mr. Joe Monaco, Environmental Projects Manager
City of Chula Vista
Community Development Department
276 Fourth Avenue
Chula Vista, California 91910

Reference: Notice of Preparation of a Draft Environmental Impact Report for MCA Chula Vista Amphitheater.

Dear Mr. Monaco:

The San Diego Chapter of the California Native Plant Society (CNPS) appreciates this opportunity to comment on the above referenced project, relative to potential impacts to botanical resources. For us to adequately review and comment on the proposed project, we recommend that the following information be included in the biological technical report prepared:

1. A complete assessment of the botanical resources present within the project area should be prepared. This assessment should place particular emphasis upon the identification of listed and locally sensitive taxa and plant communities.

a. This assessment should follow the Department of Fish and Game's (CDFG) "Guidelines for Assessing Impacts to Rare Plants and Rare Natural Communities" (May 1984 which CNPS has adopted for the assessment of impacts to botanical resources. A copy (Attachment 1) has been enclosed for your reference. Plant communities identified in Attachment 2 represent threatened habitats that are both regionally and locally significant.

b. Plants to be addressed should include those which are listed by the state of California and the federal government as well as those which meet the criteria provided in Secion 15380 of the California Environmental Quality Act (CEQA).

c. The California Natural Diversity Data Base (CNNDB) should be contacted to obtain current information on any previously reported sensitive taxa or plant communities, inclusive of CDFG Significant Natural Areas as identified under Chapter 12 of the California Fish and Game Code. Information contained in the CNDDB is obtained through voluntary efforts and,as not all biologists participate, information should not be used in lieu of actual surveys. It should be used, however, for predictive purposes to determine potentially-occurring sensitive resources.

2. A thorough discussion of the direct, indirect, and cumulative impacts which would be expected to occur as a result of the approval of this discretionary permit should be provided. Specific, enforceable measures intended to reduce or eliminate such impacts should be provided as necessary.

a. CEQA Section 15125(a) directs that knowledge of the regional setting is critical to an assessment of environmental impacts and that special emphasis should be placed on resources that are rare or unique to the region. We feel that this is very important, especially in light of the large-scale regional planning efforts (MSCP and NCWF) currently being conducted in San Diego County.

b. Project impacts should also be analyzed relative to their effect on offsite habitats. This analysis should

*Dedicated to the preservation of California native flora* include nearby public lands, open space, and natural habitats.

c. An analysis of cumulative impacts should be developed as described in CEQA Section 15130. General Plans, Specific Plans and past, present, and anticipated future projects should be considered.

3. A full range of alternatives which would avoid or otherwise minimize impacts to botanical resources should be fully considered and evaluated. Specific alternative locations should be evaluated when appropriate.

a. Mitigation measures for project impacts to botanical resources should emphasize the evaluation and selection of alternatives which avoid or otherwise minimize project impacts. Offsite compensation should be considered only when it can be demonstrated that retention of onsite resources is not feasible in the long-term and should be developed with the appropriate state and/or federal agencies.

b. CNPS generally does not support the use of relocation, salvage, and/or transplantation as a mitigation measure for impacts to plant taxa. Such efforts have been largely unsuccessful.

4. If this project has the potential to adversely affect plant taxa listed under the California Endangered Species Act (CESA), either during construction or over the life of the project, a permit must be obtained pursuant to Section 2081 of the California Fish and Game Code. Such permits are isued to conserve, protect, enhance, and restore state-listed threatened or endangered taxa and their habitats. We would advise early consultation with the Region 5 plant ecologist, CDFG. Impacts to federally listed taxa will require coordination with U.S. Fish and Wildlife Service botanists at the Carlsbad Field Office.

Thank you for this opportunity to comment on the draft EIR for Santa Fe Valley Specific Plan. We would like to receive a copy of the biological technical report prepared for this action during the public review period. If you have questions regarding the contents of this letter or wish to discuss any of the issues in detail, please contact me at 278-9573.

Respectfullly,

Bertha McKinley

Bertha McKinley
President, San Diego Chapter

Attachments
1. Survey Guidelines
2. R-5 Sensitive Plant Communities

cc: Ray Butler, CNPS Conservation Chair
Jim Dice, Region 5 Plant Ecologist, CDFG
Fred Roberts, Botanist, Carlsbad Field Office, USFWS

ATTACHMENT 1 *

The Resources Agency
Department of Fish and Game
May 4, 1984

## GUIDELINES FOR ASSESSING EFFECTS OF PROPOSED DEVELOPMENTS ON RARE AND ENDANGERED PLANTS AND PLANT COMMUNITIES

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how field surveys should be conducted, and what information should be contained in the survey report.

1. Botanical surveys that are conducted to determine the environmental effects of a proposed development should be directed to all rare and endangered plants and plant communities. Rare and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare and/or endangered under the following definitions.

A species, subspecies or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition or disease. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

Rare plant communities are those communities that are of highly limited distribution. These communities may or may not contain rare or endangered species. The most current version of the California Natural Diversity Data Base's Outline of Terrestrial Communities in California may be used as a guide to the names of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or the extent that, rare plants will be affected by a proposed project when:

a. Based on a initial biological assessment, it appears that the project may damage potential rare plant habitat;

b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking; or

c. No initial biological assessment has been conducted and it is unknown whether or not rare plants or their habitat exists on the site.

3. Botanical consultants should be selected on the basis of posssession of the follloving qualifications (in order of importance):

a. Experience as a botanical field investigator with experience in field sampling design and field methods;

b. Taxonomic experience and a knowledge of plant ecology;

c. Familiarity with the plants of the area, including rare species; and

d. Familiarity with the apppropriate state and federal statutes related to rare plants and plant collecting.

4. Field surveys should be conducted in a manner that will locate any rare or endangered species that may be present. Specifically, rare or endangered plant surveys should be:

a. Conducted at the proper time of year when rare or endangered species are both "evident" and identifiable. Field surveys should be scheduled (1) to coincide with known flowering periods, and/or (2) during periods of phenological development that are necessary to identify the plant species of concern.

b. Floristic in nature. "Predictive surveys" (which predict the occurence of rare species based on the occurence of habitat or other physical features rather than actual field inspection) should be reserved for autoecological studies, not for impact assessment. Every species noted in the field should be identified to the extent necessary to determine whether it is rare or endangered.

c. Conducted in a manner that is consistent with conservation ethics. Collections of rare or suspected rare species (voucher specimens) should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit regulations. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.

e. Well documented. When a rare or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form should be completed and submitted to the Natural Diversity Data Base.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations, EIRs and EISs, and should contain the following information:

a. Project description, including a detailed map of the project location and study area.

b. A written description of biological setting referencing the community nomenclature used, and a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys.

e. Results of survey (include detailed maps).

f. An assessment of potential impacts.

g. Discussion of the importance of rare plant populations with consideration of nearby populations and total species distribution.

h. Recommended mitigation measures to reduce or avoid impacts.

i. List of all species identified.

j. Copies of all California Native Species Field Survey Forms or Natural Commuunty Field Survey Forms.

k. Name of field investigator(s).

l. References cited, persons contacted, herbaria visited, and disposition of voucher specimens.

*CNPS, 1988 Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants.

ATTACHMENT 2

| Plant Community | Element Code* |
|---|---|
| Active Coastal Dunes | 21100 |
| Southern Foredunes | 21230 |
| Southern Dune Scrub | 21330 |
| Active Desert Dunes | 22100 |
| Southern Coastal Bluff Scrub | 31200 |
| Maritime Succulent Scrub | 32400 |
| Diegan Coastal Sage Scrub | 32500 |
| Southern Mixed Chaparral (on gabbro soils) | 37120 |
| Scrub Oak Chaparral (dominated by Quercus dumosa) | 37900 |
| Southern Maritime Chaparral | 37C20 |
| Coastal Sage - Chaparral Scrub | 37G00 |
| Valley Needlegrass Grassland | 42110 |
| Wildflower Field | 42300 |
| San Diego Mesa Hardpan Vernal Pool | 44321 |
| San Diego Mesa Claypan Vernal Pool | 44322 |
| Montane Meadow | 45100 |
| Freshwater Seep | 45400 |
| Southern Coastal Saltmarsh | 52120 |
| Coastal and Valley Freshwater Marsh | 53410 |
| Southern Coast Live Oak Riparian Forest | 61310 |
| Southern Cottonwood-Willow Riparian Forest | 61330 |
| White Alder Riparian Forest | 61430 |
| Mesquite Bosque | 61820 |
| Sycamore Alluvial Woodland | 62100 |
| Desert Dry Wash Woodland | 62200 |
| Southern Sycamore-Alder Riparian Woodland | 62400 |
| Mule Fat Scrub | 63310 |
| Southern Willow Scrub | 63320 |
| Coast Live Oak Woodland | 71160 |
| Open Engelmann Oak Woodland | 71181 |
| Dense Engelmann Oak Woodland | 71182 |
| Torrey Pine Forest | 83140 |
| Southern Interior Cypress Forest | 83330 |

*Holland, R.F. 1986 Preliminary Decriptions of the Terrestrial Natural Communities of California. California Department of Fish and Game, Natural Heritage Division, Sacramento.

**The Baldwin Company**
*Craftsmanship in building since 1956*

April 18, 1995

Mr. Joe Monaco
Environmental Projects Manager
City of Chula Vista
276 Fourth Ave
Chula Vista, CA 91910

Dear Joe:

The Baldwin Company is in receipt of the Notice of Preparation for a draft Environmental Impact Report for the MCA Chula Vista Amphitheater. The Baldwin Company is the owner of Dennery Ranch located immediately adjacent to the proposed project site within the City of San Diego. The Baldwin Company has obtained a Vesting Tentative Map for Dennery Ranch and has plans to proceed immediately with the development of the project.

Be advised that while the Notice of Preparation is dated March 22, 1995, The Baldwin Company did not receive a copy of the Notice of Preparation until March 28, 1995. Be further advised that a copy of the Initial Study for the project was not attached to the Notice of Preparation, requiring The Baldwin Company to request that the Initial Study be forwarded to us by mail. After review of the Notice of Preparation and the Initial Study, The Baldwin Company has several concerns as discussed below.

A layman's view of the project site, the proposed use, and the proximity of adjacent uses leads to the conclusion that noise is a significant unmitigable impact for the amphitheater. It is important to accurately ascertain the extent of the potential noise impact of the project. In this regard, the Environmental Impact Report should contain a thorough analysis of potential impact, including a noise study which analyzes the impact vis-a-vis, Chula Vista noise standards and the standards promulgated by the City of San Diego. The latter review is necessary because the bulk of the noise impact would be on land within the jurisdictional boundaries of the City of San Diego.

11975 El Camino Real • Suite 200 • San Diego, CA 92130 • (619) 259-2900

Second, the Initial Study suggests that the land use impact of the proposed project is less than significant. Again, it is apparent that a 20,000 seat outdoor amphitheater conflicts with the immediately adjacent approved residential land uses within the City of San Diego.

Third, also concerning land use impacts of the proposed uses, it is apparent that a 20,000 seat amphitheater located in the middle of the Otay Valley Regional Park creates a significant and unmitigable impact on potential park uses.

Fourth, the Initial Study suggests transportation could be a significant, but mitigable impact. Again, it is apparent that a high activity use, such as a 20,000 seat amphitheater located with a single point of access (Otay Valley Road) will create significant traffic congestion and raise safety questions. These issues should be thoroughly analyzed in the EIR.

Fifth, the Initial Study suggests that the 20,000 seat amphitheater could create significant, but mitigable aesthetic impacts. Again, it is apparent that a structure of this size located in the heart of a river valley and regional park would create a significant and unmitigable impact. The issue of aesthetics should be carefully analyzed in the EIR including photo simulations from the valley floor, the regional park and from the mesa south of the project area (Dennery Ranch).

Sixth, the San Diego region is currently a non-attainment area for State and Federal air quality emissions. The location of a 20,000 seat activity center would likely create a hot spot of emissions. Accordingly, direct and cumulative air quality impacts should be carefully analyzed in the EIR.

Finally, the Otay River Valley contains environmentally sensitive resources as evidenced by the fact that the recently adopted Otay Ranch GDP designated all 3,000 acres of the River Valley within Otay Ranch as open space requiring protection, revegetation and restoration. Furthermore, the Otay River Valley is currently within draft MSCP boundaries. Accordingly, the direct and indirect impact of the 20,000 seat amphitheater on adjacent biological resources should be carefully evaluated.

Your consideration of these comments is appreciated.

Sincerely,

Tim O'Grady

Tim O'Grady
Vice President

TOG/cc

## APPENDIX B

## TRANSPORTATION/CIRCULATION

# MCA Amphitheater
# *Traffic Impact Study*

Prepared for:

CITY OF
CHULA VISTA

Applicant:

**Starboard Development**
**San Diego, California**

Prepared by:

B R W

**BRW, Inc.**
**620 C Street, Suite 300**
**San Diego California 92101**

May 31, 1995

# Table of Contents

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APPENDICES

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# List of Tables

# Executive Summary

This report documents potential traffic impacts associated with the proposed MCA Amphitheater in the City of Chula Vista. Three timeframes of analysis are presented including Opening Day 1996, Interim Year 2010 ("worst case") and full Southbay Buildout (after the Year 2015). The results of this analysis will be incorporated into the Environmental Impact Report for the project.

This traffic analysis was conducted in compliance with the enhanced California Environmental Quality Act (CEQA) project review process as part of the regional Congestion Management Program (CMP) requirements. This process is required for large projects which are expected to generate 2,400 or more average daily trips, or 200 or more peak hour trips. The CMP defined study area must include regional arterials where the proposed project will add 50 or more peak hour trips or freeway segments where 150 or more peak hour trips will be added. This project will generate more than 2,400 daily trips during arrival and departure periods, typically concentrated in off-peak evening hours when concert events occur (35-60 nights per year). This analysis meets the requirement that short-term and long-term, including buildout, timeframes be evaluated to determine impacts. In addition, the analysis recommends mitigation including roadway capacity enhancements, geometric improvements and traffic control measures to maintain acceptable operations.

The proposed location for the amphitheater is east of I-805 in the Otay River Valley. The facility would be located off Otay Valley Road just south of the Otay River crossing. The project location is generally undeveloped with the exception of an industrial park near the site. The outdoor amphitheater will seat approximately 20,000 patrons, with 10,000 assigned seats, and additional lawn seating for the remaining patrons. An estimated 6,200 parking spaces will be provided. Curtain rise for performances would be between 7:00 p.m. and 8:00 p.m. The project site will be also be used for open-air markets from Thursday through Sunday during daytime hours when concert events are not scheduled.

While significant traffic impacts are not expected to result with the construction of the amphitheater under Opening Day, Interim Year 2010 or Buildout conditions, short-term and long-term mitigation measures are presented to ensure adequate operations during events. Short-term mitigation includes the completion and/or modification of planned roadway and I-805/Otay Valley Road interchange improvements, traffic control and channelization procedures, the provision of a traffic signal at Otay Valley Road/Otay Rio Road and develop of a mitigation and monitoring program.

A recommended event monitoring program (EMP) is also presented. This EMP is critical in that it will assist the City of Chula Vista, amphitheater management and other involved parties in the refinement of traffic management plans suitable to various event sizes and sensitive to adjacent residential and business interests.

# 1.0 Introduction

This Chapter provides a brief introduction of the proposed MCA Amphitheater project, focusing on the purpose of the report and providing an overview of the report organization.

## 1.1 PURPOSE

The purpose of this report is to document the traffic impacts associated with the proposed MCA Amphitheater in the City of Chula Vista, California. The identification and analysis of traffic impacts is conducted in accordance with City of Chula Vista requirements and will be incorporated into the traffic section of the project Environmental Impact Report (EIR), prepared separately by Tetra Tech, Inc.

The proposed amphitheater will be located on Otay Valley Road south of the Otay River crossing. The 20,000 seat facility will be used for an estimated 35 to 60 entertainment events annually. The facility will also be used for open-air markets during those times when events are not scheduled.

## 1.2 ORGANIZATION OF REPORT

Following this introduction, Chapter 2.0 presents existing conditions for the site location and the surrounding circulation network. Chapter 3.0 provides a detailed description of the proposed project. Theater and open-air market operations are also described. Based on these operations and the experience of similar sites, trip generation, distribution and assignment assumptions are presented. Opening Day conditions (1996) are presented in Chapter 4.0, while Chapter 5.0 documents Interim Year 2010 conditions. Both Opening Day and Interim Conditions provide baseline traffic conditions prior to the addition of project generated traffic in order to facilitate the identification of impacts directly attributable to the project. Lastly, Chapter 6.0 presents mitigation measures for impacts associated with the project. Due to the facility type, this chapter includes a mitigation monitoring program to evaluate the effectiveness of proposed mitigation actions.

# 2.0 Existing Conditions

This Chapter presents existing conditions in the vicinity of the proposed amphitheater, including a description of the regional location of the project site and the adjacent circulation network. City of Chula Vista roadway capacity and corresponding level of service standards are presented, as are current operating conditions and access configurations of I-805 and Otay Valley Road. This information sets the existing baseline conditions against which future traffic conditions can be compared.

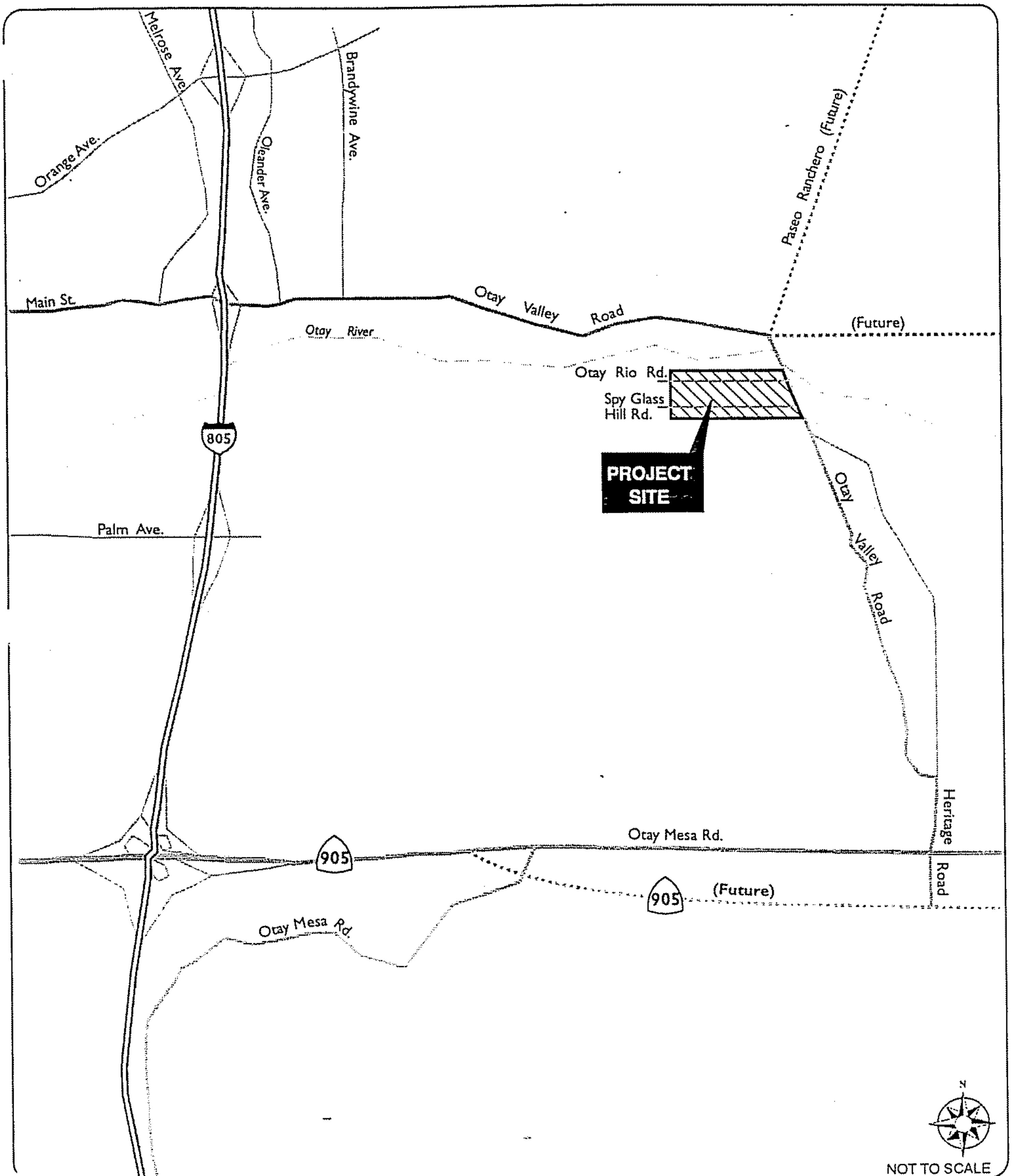
## 2.1 REGIONAL LOCATION

As indicated in Figure 1, the proposed MCA Amphitheater would be located east of I-805 and north of SR-905 in the Otay River Valley. More specifically, the project site would be located on Otay Valley Road in southern Chula Vista just south of the Otay River crossing. Otay Valley Road extends easterly from I-805 to the eastern Chula Vista City Limits before turning south towards SR-905. West of I-805, Otay Valley Road becomes Main Street.

The area is generally undeveloped with the exception of an industrial subdivision, Otay Rio Industrial Park, which will house the City of Chula Vista Corporation Yard. This facility will be used by departments such as Public Works, Parks and Recreation, and Chula Vista Transit services. Brown Field Municipal Airport is located approximately one mile to the southeast, while the U.S./Mexico Border is three miles to the south.

## 2.2 STREET AND HIGHWAY NETWORK

The street and highway system in the vicinity of the project site is shown in Figure 2. This figure indicates the number of through lanes for each facility as well as the number of turn lanes at each of the major study intersections planned to be in place by Opening Day in 1996. Regional access from the north to the site will be provided primarily by I-805. This facility is an eight-lane interstate freeway with local interchanges at Otay Valley Road/Main Street, Palm Avenue to the south, and Orange Avenue to the north. A significant number of patrons are expected from this direction.

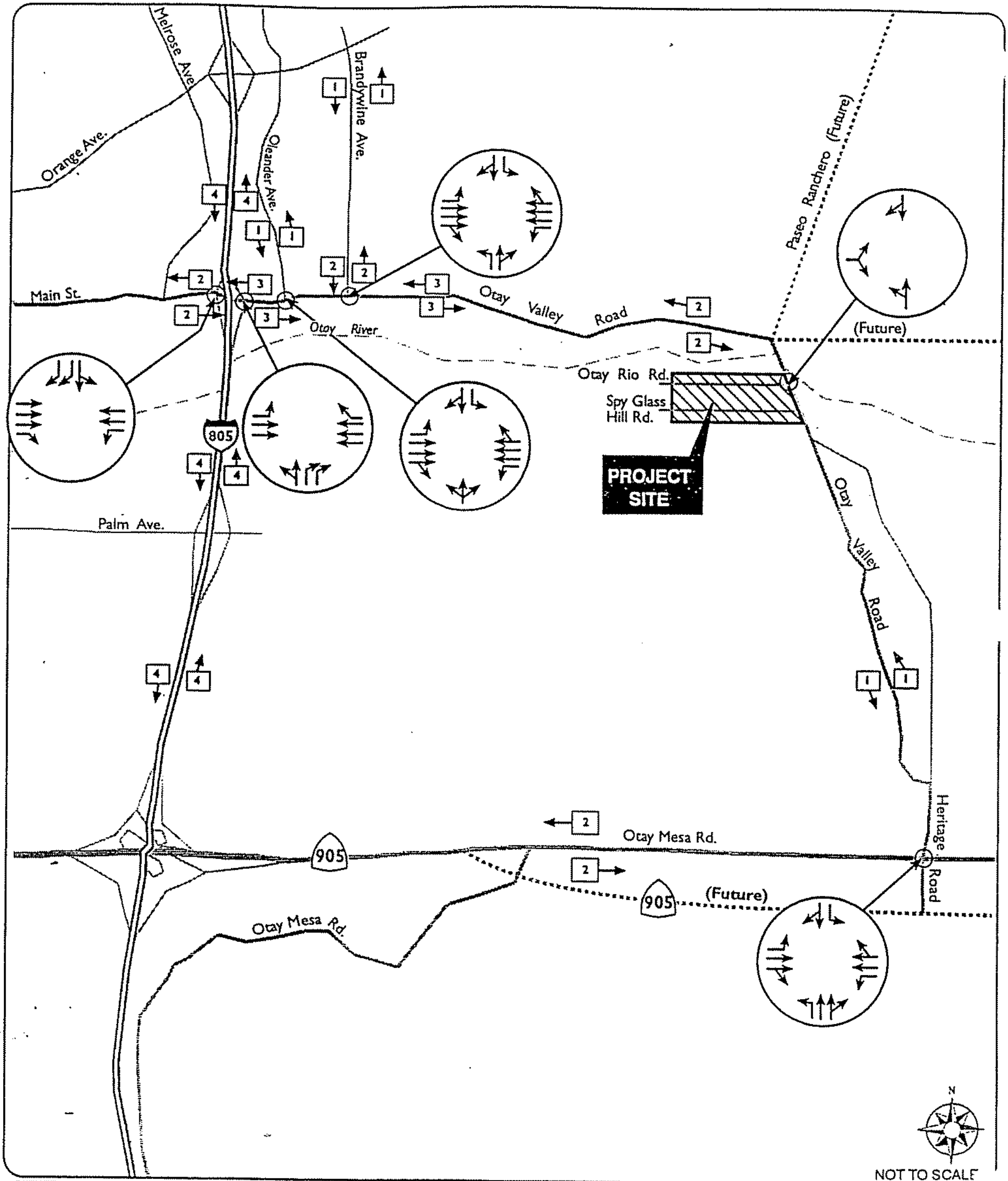



MCA AMPHITHEATER
Traffic Impact Analysis
Chula Vista, California

BRW 620 C Street, Suite 300
San Diego, California

Figure 1
Regional Location

Source: BRW, Inc.; March 31, 1995




MCA AMPHITHEATER
Traffic Impact Analysis
Chula Vista, California

BRW 620 C Street, Suite 300
San Diego, California

LEGEND

X Number of Through Traffic Lanes

Figure 2
## Year 1996 Conditions
## Street and Highway System

Source: BRW, Inc.;April 26, 1995

Regional access is also provided from the south via SR-905, Otay Mesa Road and I-805. SR-905 is an at-grade expressway of six lanes that extends from I-5 on the west to link with Otay Mesa Road on the east. Otay Mesa Road extends to Heritage Road and continues easterly to the Otay Mesa Border crossing with Mexico. A considerable number of patrons are expected to come from the south also, where I-805 connects with I-5 north of the San Ysidro Border crossing.

Otay Valley Road is currently under construction to be widened to a six-lane divided cross-section. The initial section of this widening project is underway from east of I-805 to Nirvana Avenue. A subsequent widening project is planned from Nirvana Avenue east to the Otay River crossing and is planned to add two lanes in each direction separated by a barrier median. This cross-section is temporary until the ultimate street width of six lanes is needed.

North of the Otay River bridge, Otay Valley Road splits with a wye-type intersection to allow trucks hauling refuse to continue east. Otay Valley Road curves southerly at that point. South of the Otay River, Otay Valley Road becomes Heritage Road and intersects with Otay Mesa Road in the City of San Diego.

Otay Valley Road is intersected by two local collector streets, Oleander Avenue and Brandywine Avenue, between I-805 and the Otay River crossing. Each of these facilities extends north from Otay Valley Road before eventually connecting to Orange Avenue. Oleander Avenue provides direct access into residential areas, whereas Brandywine Avenue does not have fronting residential properties but serves as a collector for the area. Limited traffic is expected to access the site via these two facilities.

The project site itself is traversed by two streets, Otay Rio Road and Spy Glass Hill Road. Otay Rio Road extends west from Otay Valley Road into the industrial subdivision. Access will be maintained to this industrial area at all times with at least one lane in each direction and the ability to turn onto Otay Valley Road during amphitheater or open-air market events. Spy Glass Hill Road, which runs parallel to the south of Otay Rio Road, also extends into the industrial area. However, this facility is planned to be converted to a private drive with the construction of the amphitheater.

## 2.3 ROADWAY CAPACITY STANDARDS

The City of Chula Vista employs roadway cross-section design standards for the circulation network. These threshold standards are based on projected volumes and a roadway segment level of service (LOS) C. Level of service A indicates free flow traffic operations, while LOS F represents highly unstable, congested conditions. It should be noted that a lower level of service, LOS D, may be acceptable if detailed traffic analyses reveal that peak hour LOS D threshold standards are not exceeded. The daily volumes and corresponding levels of service standards (LOS C and D) are shown in Table 1.

**TABLE 1**
**ROADWAY CAPACITY STANDARDS**
**CITY OF CHULA VISTA**

| ROADWAY CLASS | X-SECTION | LEVEL OF SERVICE THRESHOLD VOLUMES | |
|---|---|---|---|
| | | LOS C | LOS D |
| Expressway | 104/128 | 70,000 | 78,800 |
| Prime Arterial | 104/128 | 50,000 | 56,300 |
| Major Street (6 lanes) | 104/128 | 40,000 | 45,000 |
| Major Street (4 lanes) | 80/104 | 30,000 | 33,800 |
| Class I Collector | 74/94 | 22,000 | 24,800 |
| Class II Collector | 52/72 | 12,000 | 13,500 |
| Class III Collector | 40/60 | 7,500 | 8,400 |

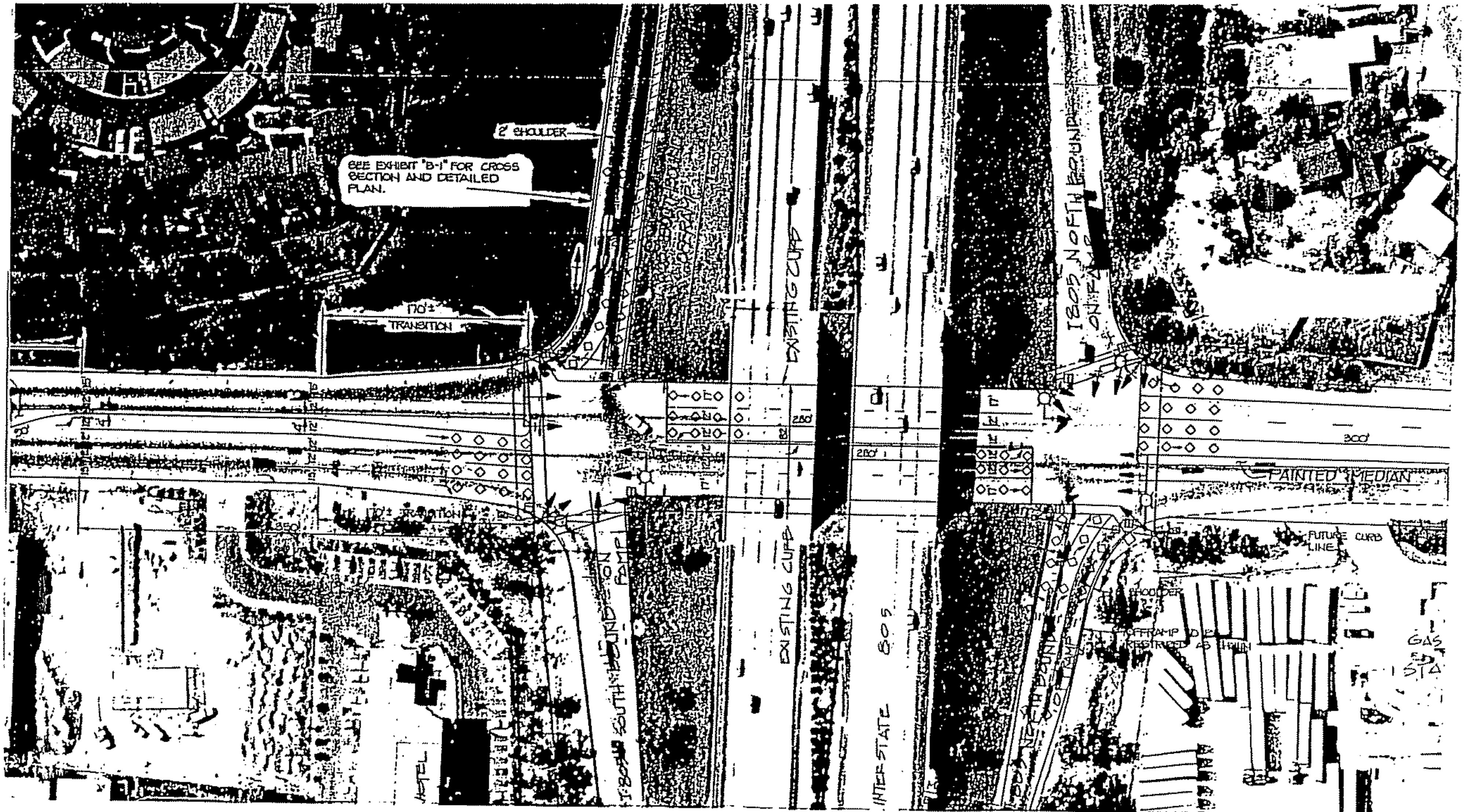
SOURCE: City of Chula Vista; 1995.

## 2.4 I-805 ACCESS AND OPERATIONS

Caltrans is responsible for the operation and maintenance of the regional freeway system and freeway interchanges. I-805 currently has four lanes in each direction with local access provided at Otay Valley Road in the form of a "tight diamond" interchange. The intersections of the freeway off-ramps and Otay Valley Road are presently controlled by all-way stop signs. Under a separate agreement between the City of Chula Vista and Caltrans, Caltrans will widen the off-ramps and construct signals at the on- and off-ramps. Construction is planned to commence in June 1995 and the signals will be in operation by Opening Day in 1996. Figure 3 illustrates the improvement plans for the I-805/Otay Valley Road interchange.

### Traffic Counts

Traffic counts were conducted at the intersection ramps during March and April 1995. The turning movement counts were used to assess the existing operations of the intersections at the northbound and southbound ramps based on signalized intersection operations at each location. The intersection capacity worksheets are included in Appendix A. The results of these calculations are presented in Table 2.




MCA AMPHITHEATER
Traffic Impact Analysis
Chula Vista, California

520 C Street, Suite 300
San Diego, California

Figure 3
**I-805 Otay Valley Road Interchange Concept Plans**

Source: Caltrans Project Stu... d, 1995

# TABLE 2
# I-805/OTAY VALLEY ROAD - MAIN STREET INTERCHANGE
# 1995 EXISTING CONDITION LEVELS OF SERVICE [1]
# P.M. PEAK HOUR

| Movement | 1995 Movement Count Volumes | Delay | Level of Service |
|---|---|---|---|
| *Northbound Ramps* | | | |
| Northbound Left/Through<br>Northbound Right | 221<br>176 | 20.3<br>14.2 | C<br>B |
| Eastbound Left<br>Eastbound Through | 372<br>337 | 19.2<br>1.7 | C<br>A |
| Westbound Right<br>Westbound Through | 403<br>454 | 14.4<br>8.6 | B<br>B |
| Intersection Total | | 12.5 | B |
| *Southbound Ramps* | | | |
| Southbound Left/Through<br>Southbound Right | 242<br>267 | 13.2<br>11.9 | B<br>B |
| Eastbound Right<br>Eastbound Through | 318<br>466 | 14.2<br>10.1 | B<br>B |
| Westbound Left<br>Westbound Through | 246<br>358 | 15.7<br>2.9 | C<br>A |
| Intersection Total | | 10.8 | B |

SOURCE: BRW, Inc.; April 1995.

(1) Based on assumption of signalized control.

## 2.5 OTAY VALLEY ROAD ACCESS AND OPERATIONS

As stated previously, Otay Valley Road is currently under construction to be widened to a six-lane prime arterial. The widening will include signals at Oleander Avenue, Brandywine Avenue and Nirvana Avenue. East of Nirvana Avenue, the roadway will be constructed with two westbound lanes and two eastbound lanes. As will be discussed in Chapter 6.0, Mitigation and Monitoring Program, an additional westbound lane is recommended as a modification to the planned improvements as mitigation by Opening Day 1996. An additional eastbound lane will be added in the future when traffic volumes warrant the need for additional capacity. This increase in capacity can provide the improvements necessary to meet project mitigation requirements. In addition to this widening project, Otay Valley Road will be extended easterly to link with future SR-125 as a two-lane collector, and ultimately a four- or six-lane facility. Figure 4 illustrates the Otay Valley Road layout in the vicinity of the project site.

Land uses that are adjacent to Otay Valley Road in this area include the following:

- **Auto Mall** - A Southbay Auto Mall recently opened on the south side of Otay Valley Road with direct access at Brandywine Avenue. The first phase of the Mall has been in operation for approximately two years with space for three dealerships. The retail space is not fully occupied at this time. A second phase is planned within the next ten years as demand grows. The Auto Mall operates until 9:00 or 10:00 p.m. on most evenings.

- **Residential Neighborhoods** - The land uses north of Otay Valley Road are predominately single-family and multi-family residential developments. These homes are accessed via Oleander Avenue which extends north from Otay Valley Road.

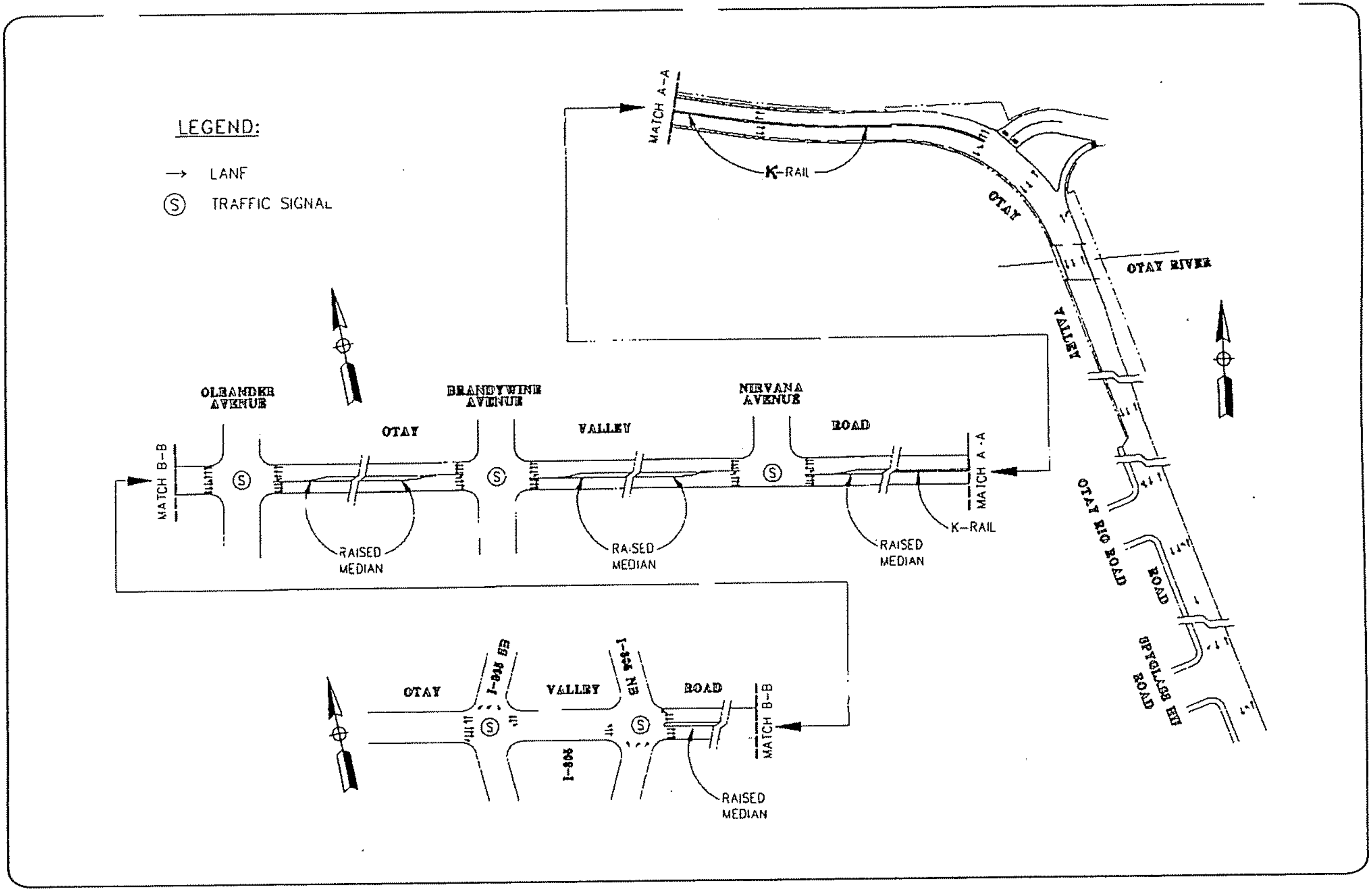



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Figure 4
**Otay Valley Road Layout**

Source: Darnell & Associates; May 1995

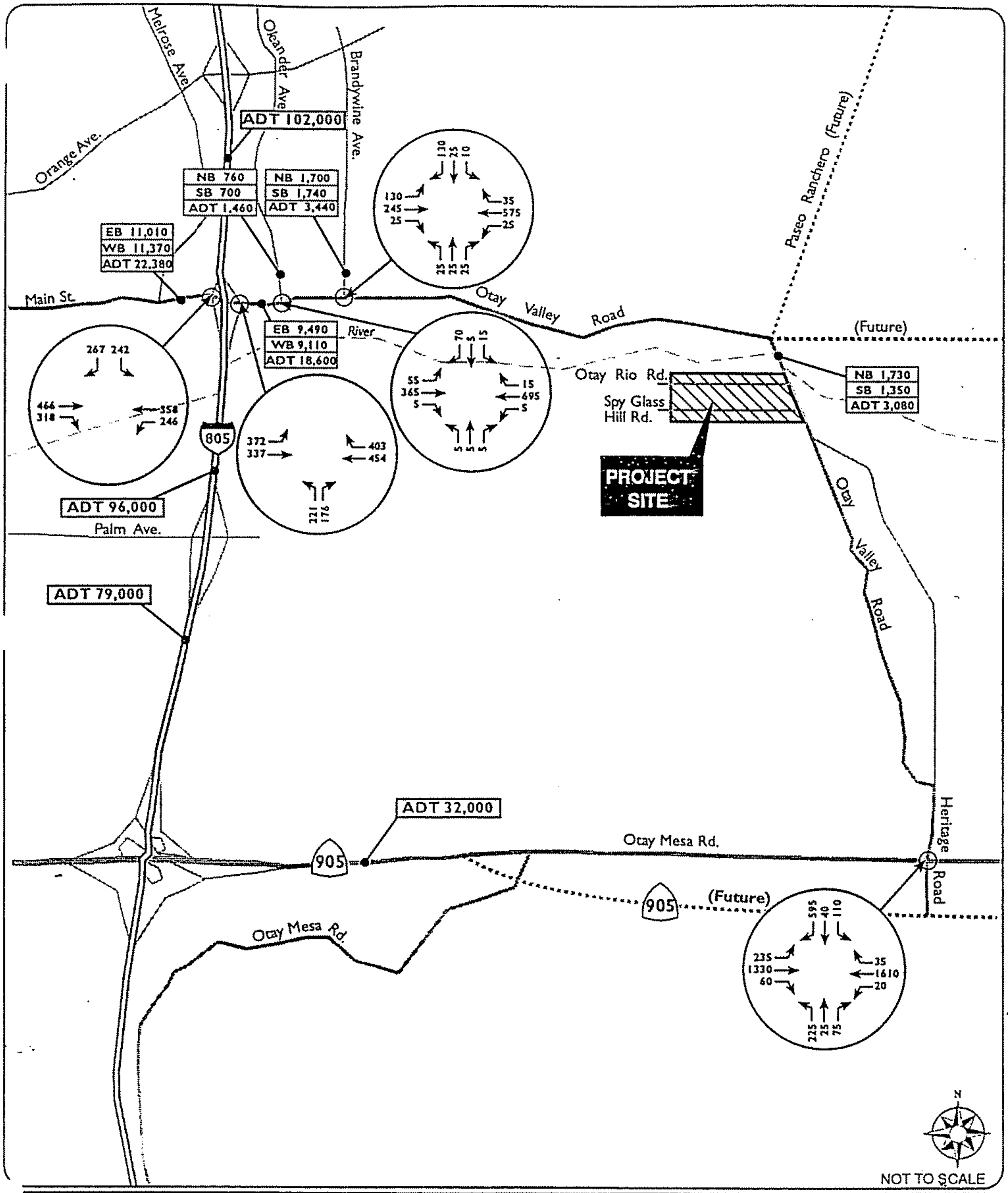
- **Otay Rio Industrial Park** - The amphitheater site sits within an industrial park, accessed by Otay Rio Road and Spy Glass Hill Road, each of which leads from Otay Valley Road into the site. On the west side of the site, the City has located a future Corporation Yard. This site will handle the maintenance and operations equipment and vehicles for the City. This will include the sanitary sewer services, street maintenance and the City transit services. These services require that 24-hour access to the Corporate Yard be maintained from Otay Valley Road via Otay Rio Road or Spy Glass Hill Road. Public access will also need to be maintained to the adjacent ten acres of industrial land. As stated previously, Spy Glass Hill Road is planned as a private access drive with the construction of the amphitheater.

- **County Landfill** - The County operates a major refuse and landfill facility which is accessed off Otay Valley Road from Maxwell Street. The access point is just north of the Otay River crossing. Refuse trucks use Otay Valley Road south to/from Otay Mesa as well as from the west to/from I-805 for access to the landfill. Most operations are concluded by mid- to late-afternoon.

- **Industrial Park** - There is also an industrial park north of Otay Valley Road and east of Brandywine Avenue. Most of these operations are concluded in the mid- to late-afternoon hours.

### Traffic Counts

Continuous tube-counts were used to collect daily traffic volume data on Otay Valley Road, Oleander Avenue and Brandywine Avenue. These counts were collected over a one week period from March 24 to April 2, 1995. The average daily volumes are shown in Figure 5.

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| | |
|---|---|
| XXX / XXX / XXX | Average Daily Traffic by Direction and Total |
| XX | PM Peak Hour Turning Movements |

Figure 5
## 1995 Existing Volumes

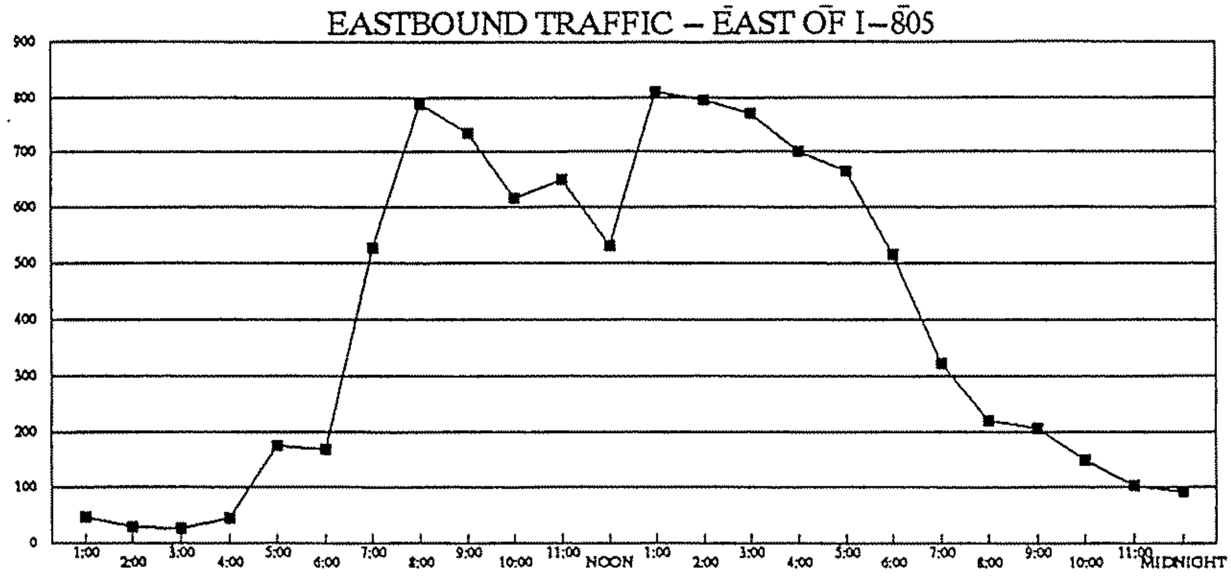
Source: Southland Car Counter, City of Chula vista; April 26, 1995

Figure 6 was also prepared to illustrate the traffic volumes plotted over a 24-hour time period for Friday, which was selected as the analysis day for the purposes of this report. This plot indicates that eastbound traffic tends to have high volumes for a longer period of time than does westbound traffic. Furthermore, while westbound traffic volumes gradually increase during the morning hours, reaching a peak at noon, eastbound traffic volumes show a pronounced increase between 6:00 a.m. and 8:00 a.m., which corresponds to the typical morning peak hour. In the afternoon and evenings, eastbound traffic gradually decreases between 3:00 p.m. and 8:00 p.m., while westbound traffic volumes decrease sharply between 5:00 p.m. and 8:00 p.m., corresponding to the typical evening peak hour which occurs between 4:00 p.m. and 5:00 p.m.

**Safety Considerations**

Otay Valley Road adjacent to the project and to the west is an arterial highway without safety lighting. The proposed access operations of the amphitheater will rely heavily on reversible lanes and the coning of the lanes through the large radius curve of Otay Valley Road. Because of these conditions it is recommended that continuous street lighting be installed along Otay Valley Road in front of the project as well as on Otay Valley Road to the north and west.

The type of lighting should conform to the City of Chula Vista standards. Furthermore, the level of lighting should be increased to account for the heavy vehicle activity that is expected to occur during concert events.



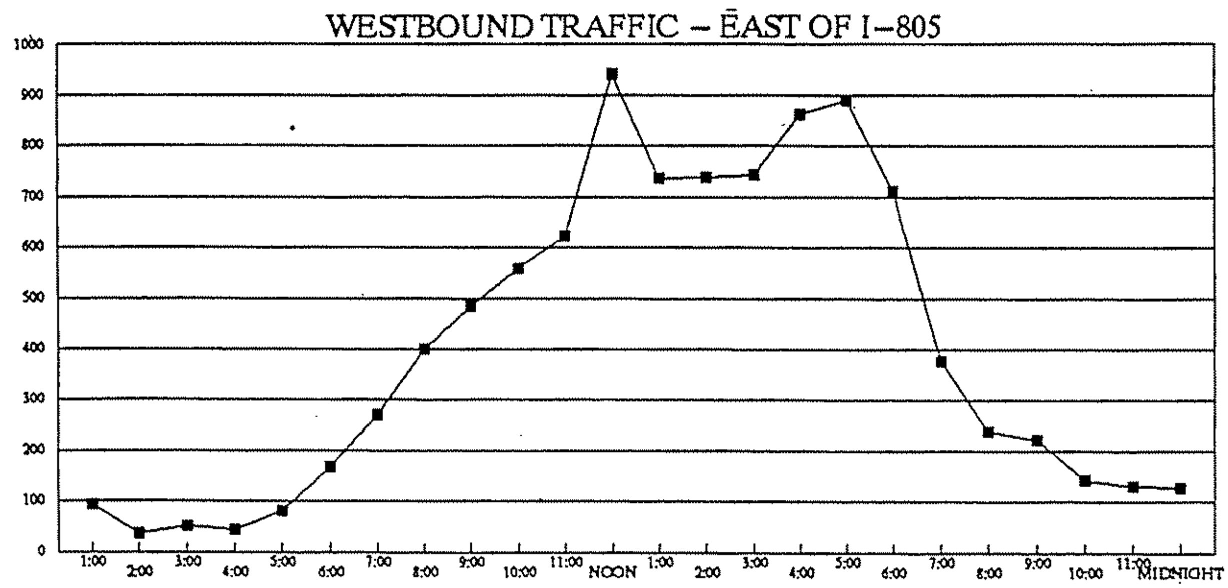




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Figure 6
**Otay Valley Road Daily Traffic Hourly Distribution**
East of I-805

Source: City of Chula Vista (tube count on 3/24/95); BRW, Inc.; April 18, 1995

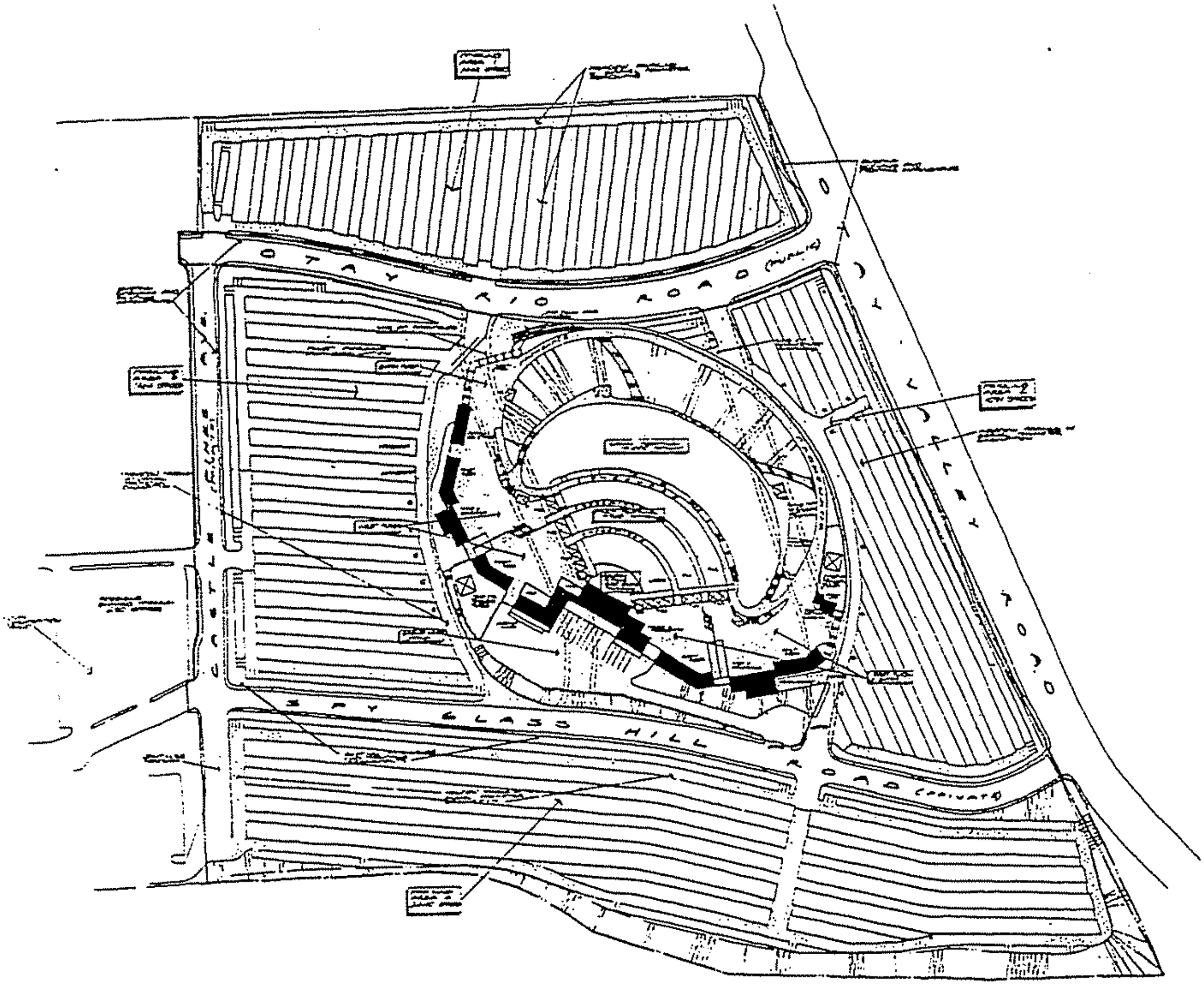
# 3.0 Project Description and Operating Assumptions

This Chapter presents a detailed description of the proposed amphitheater, illustrating the project site plan. Theater and open-air market access and operating assumptions are also provided. Trip generation is calculated using experience from similar sites. Trip distribution for the facility is also presented. Finally, trips that are expected to be generated by the project site are assigned to the street and highway system for addition to the Opening Day 1996 and Interim Year 2010 traffic conditions.

## 3.1 PROJECT DESCRIPTION

The MCA Amphitheater is planned to be a 20,000 seat outdoor facility. Fixed seating will be provided for about 10,000 patrons with lawn seating for the remaining 10,000 patrons. The theater will be surrounded by a parking facility for an estimated 6,200 vehicles. An open-air market would also be operated on a portion of the parking area on days (typically Thursday through Sunday) when the amphitheater is not scheduled for daytime event use.

Approximately 250 employees are anticipated for theater operations. Fifty employees are expected to be needed for the open-air market, in addition to the actual vendors. The number of actual vendors will vary depending on the size of the market, and is assumed to be up to 250 vendors based on similar operations. The theater is anticipated to be used 35 to 60 nights per year. The curtain for performances would rise between 7:00 and 8:00 p.m. for most events. The open-air market would utilize the site on Thursday through Sunday from 7:00 a.m. to about 4:00 p.m. A conceptual site plan of the facility and parking area is shown in Figure 7.




## Site Summary

| | |
|---|---|
| Amphitheatre and Parking area | 60.5 Acres± |
| Amphitheatre only | 17.0 Acres± |

### Parking:

| | |
|---|---|
| Area #1 | 1442 Spaces |
| Area #2 | 1091 Spaces |
| Area #3 | 1464 Spaces |
| Total | 6237 Spaces |
| Handicap spaces | 126 |
| Compact spaces | 1575 |
| Standard Spaces | 4536 |
| Stall Size (Std.) | 8.5' x 18' |
| Aisle Size | 25' |
| Drive Aisles | 36' |
| Main Drive Aisles | 48' and 60' |
| Handicap Stall Size | 12' x 18' |
| Compact Stall Size | 8' x 18' |

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Figure 7
**Proposed Site Plan**

Source: BBA Architects/ Planners; April 26, 1995

### 3.1.1 Theater Site Access Operations

A critical assumption on which this traffic analysis is based is access operations for the amphitheater. According to MCA as the theater operator, the following procedure will be used for the site access operations. This procedure has been formulated for a sell-out or near sell-out concert operations plan.

- Traffic control equipment and personnel would be set in place two hours before curtain.

- Patrons would begin arriving anywhere from about one to two hours before a typical 8:00 p.m. show.

- Off-duty police/sheriff officers or contracted traffic monitors would be dispersed to critical locations and used to control intersections at the I-805 ramps and along Otay Valley Road at Oleander and Brandywine Avenues as well as adjacent to and on the site.

- Southbound traffic on Otay Valley Road would access the site from three turning lanes onto Otay Rio Road. One lane would be available for outbound traffic (refer to Figure 7).

- Northbound traffic on Otay Valley Road would access the site via Spy Glass Hill Road, which is planned as a private facility (refer to Figure 7).

Once vehicles have accessed the site, the following procedure would be used to fill the parking areas:

- A parking charge will be collected from each vehicle using the parking lot. Money collectors will be staged on each driveway into the lot.

- The parking area closest to the amphitheater would be filled first.

- The parking areas would then be filled working west to Castle Pines Avenue which forms the west border of the site, then south to fill back towards Otay Valley Road, then finally north of Otay Rio Road east toward Otay Valley Road, filling in a counter-clockwise direction.

Departing traffic would be handled in the following fashion:

- Primary traffic flow out of the amphitheater will be oriented north and west to I-805. The inbound traffic control procedures across the Otay River bridge will be reversed to provide three northbound/westbound lanes and one eastbound/southbound lane. Appropriate signing and coning procedures will have to be developed.

- Most departures would be made to the north along Otay Valley Road. Three lanes northbound with one lane southbound will be maintained across the bridge and connect with the three westbound lanes at Otay Valley Road. Two lanes will extend from Spy Glass Hill Road north to join three lanes from Otay Rio Road. The departing traffic would then be merged together at the Otay Rio Road/Otay Valley Road intersections.

- Two lanes will exit at Spy Glass Hill Road with one turning north and the other to the south.

- Off-duty police/sheriff officers and/or contracted traffic monitors would also be used for the exiting traffic control to and from the amphitheater and at intersections along Otay Valley Road to I-805. If necessary, traffic officers would also be placed at the intersection of Heritage Road (Otay Valley Road) with Otay Mesa Road.

Service Access

Artist, truck, service and emergency vehicle ingress would access the site along Spy Glass Hill Road to the back-of-house/stage drive entry and on-site security facilities. Artist and truck access, as well as bus traffic, would gain access to the project site from Otay Mesa Road to Heritage Road and Otay Valley Road, continuing north to Spy Glass Hill Road. This less congested route will allow for timely arrivals and set up prior to curtain call. The artist's exit would retrace this route while trucks would exit Otay Valley Road to I-805 as the hour of departure will be quite late and most traffic will have dissipated.

Management Plan

On-site amphitheater management would coordinate on a regular basis with local police and sheriff's departments, the California Highway Patrol (CHP), city managers office and local home owners associations to update and augment the traffic and circulation management plans as well as encourage input and suggestions related to proposed parking scenarios.

It is anticipated that there will be different plans for different size shows as well as for different types of concerts. During the initial opening stages of the facility it is anticipated that these plans will have to be constantly updated and refined as input is received from cooperating agencies and community groups, and as operational experience is gained by the on-site amphitheater management.

In the preliminary review of the proposed access loading/unloading assumptions, it is anticipated that the interface between vehicular and pedestrian traffic will need to be carefully controlled. Once the internal parking lots are full and vehicles are forced to utilized the outer ring, pedestrians will be required to cross public roads. One solution to reduce this safety conflict would be consideration of realigning Otay Rio Road to the north and including the entire amphitheater parking inside the sphere of the public roads. This alternative would also provide a better separation of vehicular traffic oriented to the Corporate Yard and future properties to be developed adjacent to the

Corporate Yard. This alternative will be discussed later in the mitigation monitoring section (Chapter 6.0) of the report.

The process for site access operations proposed by the amphitheater management has been examined and determined to provide an acceptable method of handling both arriving and departing traffic. The success of the program will be one of establishing a strategic management plan that involves the City of Chula Vista, Caltrans, CHP and law enforcement. It is envisioned that the management plan will establish procedures to be followed at each concert, tailored to the particular size of the event. After each event, the management team will meet to discuss problems, successes and ways in which to improve the program. A recommended management and mitigation monitoring program is presented in Chapter 6.0 of this report.

Pay Point for Parking

As previously mentioned, there will be paid parking. The locations for the associated pay points will fluctuate depending on concert size, concert type, and crowd characteristics. Ideally, the pay points will be located as far as possible inside the several parking areas to prevent back-up onto public streets particularly Otay Valley Road. Spy Glass Hill Road (private), Castle Pines Avenue (private) and Otay Rio Road (public) will be used for multiple lane queuing and are expected to be adequate for the largest concerts. Experience has shown that minimal queues can be anticipated when pay points are maximized. The site managers expect to implement a minimum of ten pay points which could be expanded to fourteen, depending upon crowd characteristics and back-ups experienced along the feeder roadways. These pay points are expected to be capable of handling the projected demand. The location and number of pay points in each parking area will determine the success of this operation and will require monitoring to assure success.

It should also be noted that there may be occasions where concerts begin as early as 12:00 noon. The procedures for arrival, departure, and other operational issues will be the same as those for evening concerts. These events will have to be coordinated with local officials as necessary.

### 3.1.2 Open-Air Market Operations

The open-air market is expected to be operated in a manner similar to the numerous "swap-meets" around the San Diego area. The number of sellers and shoppers attending the swap meet will vary throughout the year. Based on experience from other sites such as the Sports Arena location, attendance is highest in the summer rather than the winter, but the highest days of the year are recorded in the Christmas season.

San Diego area swap meets usually experience the highest activity on Sundays. Activity for selected days is as follows:

- Sundays: 45 to 50% of weekly patrons and sellers
- Saturdays: 35 to 40% of weekly patrons and sellers
- Fridays: 8 to 10 % of weekly patrons and sellers
- Thursdays: 3 to 5% of weekly patrons and sellers

The entrance to the open-air market is expected to close at 4:00 p.m. after which no shoppers would be admitted. Vendors are usually directed to leave the lot within one hour of closing. All shoppers would be gone by this time as well. Management staff would be expected to leave within the following hour, in this case by 6:00 p.m.

## 3.2 SITE TRIP GENERATION

Trip generation for the amphitheater and the open-air market was developed through the evaluation of other site characteristics. Comparable sites across the country were examined to estimate both auto occupancy and vehicle arrival times.

Table 3 presents the auto occupancy rate observed at concert events for various locations within California and across the country. The table shows the observed auto occupancy as well as the type of event. The average of these events shows an auto occupancy rate of just over 3.3 people per vehicle. For the purposes of this study, an occupancy rate of 3.3 persons per vehicle will be used.

## TABLE 3
## CONCERT VEHICLE OCCUPANCY DATA
## EXPERIENCE OF OTHER SITES

| DATE | DAY | PERFORMER | FACILITY | LOCATION | VEHICLE OCCUPANCY |
|---|---|---|---|---|---|
| 11/1/94 | Season | Rock and Roll Type | McNichols Arena | Denver | 3.60 |
| 11/1/94 | Season | Singer/Solo Performer | McNichols Arena | Denver | 2.80-3.20 |
| 8/27/89 | Sunday | Elton John | Poplar Creek Amphitheater | Chicago | 2.83 |
| 7/21/89 | Friday | Rod Stewart | Shoreline Amphitheater | San Francisco | 2.94 |
| 8/12/89 | Friday | Allman Brothers | Shoreline Amphitheater | San Francisco | 2.97 |
| 7/22/89 | Saturday | Tom Petty | Shoreline Amphitheater | San Francisco | 3.06 |
| 8/20/89 | Sunday | Elton John | Shoreline Amphitheater | San Francisco | 3.12 |
| 8/5/88 | Friday | Dan Fogelberg | Starplex Amphitheater | Dallas | 3.15 |
| 8/6/88 | Saturday | Huey Lewis | Starplex Amphitheater | Dallas | 3.31 |
| 6/25/89 | Sunday | Jimmy Buffet | Shoreline Amphitheater | San Francisco | 3.34 |
| 1986/87 | Season | NA | Met Center | Bloomington | 3.35 |
| 1987/88 | Season | NA | Met Center | Bloomington | 3.53 |
| 1988/89 | Season | NA | Met Center | Bloomington | 3.54 |
| 1989 | NA | The Cure | Shoreline Amphitheater | San Francisco | 3.64 |
| 1989 | NA | San Francisco Sym. | Shoreline Amphitheater | San Francisco | 3.86 |

SOURCE: BRW, Inc. based on data collected from promoters and facility operators.

Arrival and departure times is a second component of trip generation. Data was collected by BRW at other similar sites. The results of these data show that arrival distribution times are similar. Patrons typically begin to arrive one to two hours before curtain and within the first hour after curtain. The majority of patrons time their arrival at the site to be within one hour before the first curtain. People also arrive after the first curtain, which is usually a warm-up performer before the headline event.

Table 4 presents the different arrival times observed at similar amphitheater sites as well as the assumptions used in the traffic impact study for the Student Activity Center at the San Diego State University campus. After reviewing the data in Table 4, the following arrival assumptions were developed for the MCA site:

| | |
|---|---|
| Arrival 2 to 1 hours before curtain: | 20% of attendees |
| Arrival 1 to 0 hours before curtain: | 55% of attendees |
| Arrival after first curtain: | 25% of attendees |

Departure times were assumed to be highest in the hour directly following the end of the event. All people were assumed to have left the site within two hours of the end of the show. Assumptions for the departure pattern are summarized as follows:

| | |
|---|---|
| Departure 0 to 1 hours after event: | 65% of attendees |
| Departure 1 to 2 hours after event: | 35% of attendees |

Trip generation for the open-air market was also researched. Trip generation at the Kobey Swap Meet at the Sports Arena was studied in 1986 and reported in *Traffic Study for the Kobey Swap Meet in the City of San Diego* (Basmaciyan-Darnell, Inc.). Table 5 presents the trip characteristics observed at the site.

## TABLE 4
## TRIP ARRIVAL AT SIMILAR AMPHITHEATER SITES

| SITE/ EVENT SIZE | AVG. VEH. OCCUPANCY | ARRIVAL TIME | | | | NOTES |
|---|---|---|---|---|---|---|
| | | +1 HR PRIOR | 1-0 HR PRIOR | CURTAIN | EMP +2 HR | |
| 1. Blaine Amphitheatre 25,000 | 3.0 to 3.25<br>EMP = 1.1 [1] | 20% | 55% | = 75% Total In Seats | 100% | Friday Design Day = Highest Background |
| 2. Burnsville 20,000 | Varies with Total See Notes→→→<br>EMP = 1.2 | | 60% →→→ | | 100% | Arrival time and auto occupancy varied by event size:<br>10,000 = 3.0 15/70/15<br>12,000 = 3.1 20/65/15<br>14,000 = 3.2 20/65/15<br>16,000 = 3.3 25/60/15<br>18,000 = 3.4 = 20,000 [2] 25/60/15 |
| 3. Barry Fey Productions | Rock and Roll = 3.6<br>Billy Joel = 2.8 to 3.2 | | | | | |
| 4. Denver Arena | 97% by Auto<br>2.4 | 20% | 60% | = 80% Total In Seats | | Average auto occupancy of 2.4 found for events of 16,000 to 20,000 size. |
| 5. SDSU SAC (Assumed) | 2.5 | 20% | 55% | 75% | 100% | |

SOURCE: BRW, Inc., March 30, 1995.

(1) EMP = Employee Auto Occupancy and Arrival Time
(2) XX,XXX = Y.Y
Event Size = Auto Occupancy
AA/BB/CC = Arrival Percentages 2 Hours Prior/1-2 Hours Prior/After First Curtain

TABLE 5
TRIP GENERATION AT THE KOBEY SWAP MEET

| Day of Week | Auto Occupancy of Shoppers to Site | Ratio of Shoppers to Sellers | Percent of Incoming Vehicles (Last Hr. of Day) | Percent of Outgoing Vehicles (Last Hr. of Day) |
|---|---|---|---|---|
| Friday | 1.5 persons per vehicle | 9.5 shoppers per seller | 11% | 10% |
| Saturday | 1.9 persons per vehicle | 9.6 shoppers per seller | 6% | 10% |
| Sunday | 2.0 persons per vehicle | 11.5 shoppers per seller | 4% | 10% |

SOURCE: Basmaciyan-Darnell, Inc.; 1986

Since the analysis day for the MCA Traffic Study is Friday as the peak weekday, the Friday rates will be used for the Swap Meet. A total of 250 sellers are expected on a typical Friday. This would result in about 2,400 shoppers that would access the site.

**Total Trip Generation**

Table 6 presents the anticipated total trip generation for the project site. The trip generation focuses on each of the two uses and includes employees who would also access the site. Trip generation is shown for the peak hour of the facility as well as the peak hour of the adjacent street system. These times were assumed to be:

Amphitheater: Peak hour is one hour before first curtain. Both a 7:30 p.m. and an 8:00 p.m. curtain start are shown.

Open Air Market: The last hour of the day is from 3:00 p.m. to 4:00 p.m.

Adjacent Street: The peak hour is between 4:30 and 5:30 p.m. based on existing traffic counts.

# TABLE 6
# TRIP GENERATION
# (TYPICAL FRIDAY)

| LAND USE | QUANTITY | AUTO OCCUP. | ADT | FACILITY GENERATED TRAFFIC VOLUMES BY HOUR | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | MORNING | | EVENING | | | | | | | | | | | | | |
| | | | | AM IN | AM OUT | 4-5 IN | 4-5 OUT | 5-6 IN | 5-6 OUT | 6-7 IN | 6-7 OUT | 7-8 IN | 7-8 OUT | 8-9 IN | 8-9 OUT | 10-11 IN | 10-11 OUT | 11-12 IN | 11-12 OUT |
| Open Air Theatre | 20,000 Seats | 3.3 | 12,120 | N/A | N/A | 0 | 0 | 0 (1) | 0 | 1,210 (2) | 10 | 3,335 (3) | 0 | 1,515 | 0 | 0 | 3,940 (4) | 0 | 2,120 (5) |
| 8:00 PM Curtain | 250 Employees | 1.1 | 450 | 10 | 10 | 75 | 10 | 125 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 115 |
| Open Air Theatre | 20,000 Seats | 3.3 | 12,120 | N/A | N/A | 0 | 0 | 605 | 0 | 2,275 | 0 | 2,240 | 0 | 945 | 10 | 0 | 3,940 | 0 | 2,120 |
| 7:30 PM Curtain | 250 Employees | 1.1 | 450 | 10 | 10 | 230 | 10 | --- | --- | --- | --- | --- | --- | | | --- | --- | 0 | 110 |
| OPEN AIR MARKET | 50 Acres | 1.5 | 3,200 | --- | --- | 10 | 320 | --- | --- | | | | | | | | | | |
| (Friday) | 250 Sellers | 1.1 | 455 | 75 | 5 | 10 | 100 | 5 | 130 | | | | | | | | | | |

SOURCE: BRW, Inc., August, 1995.

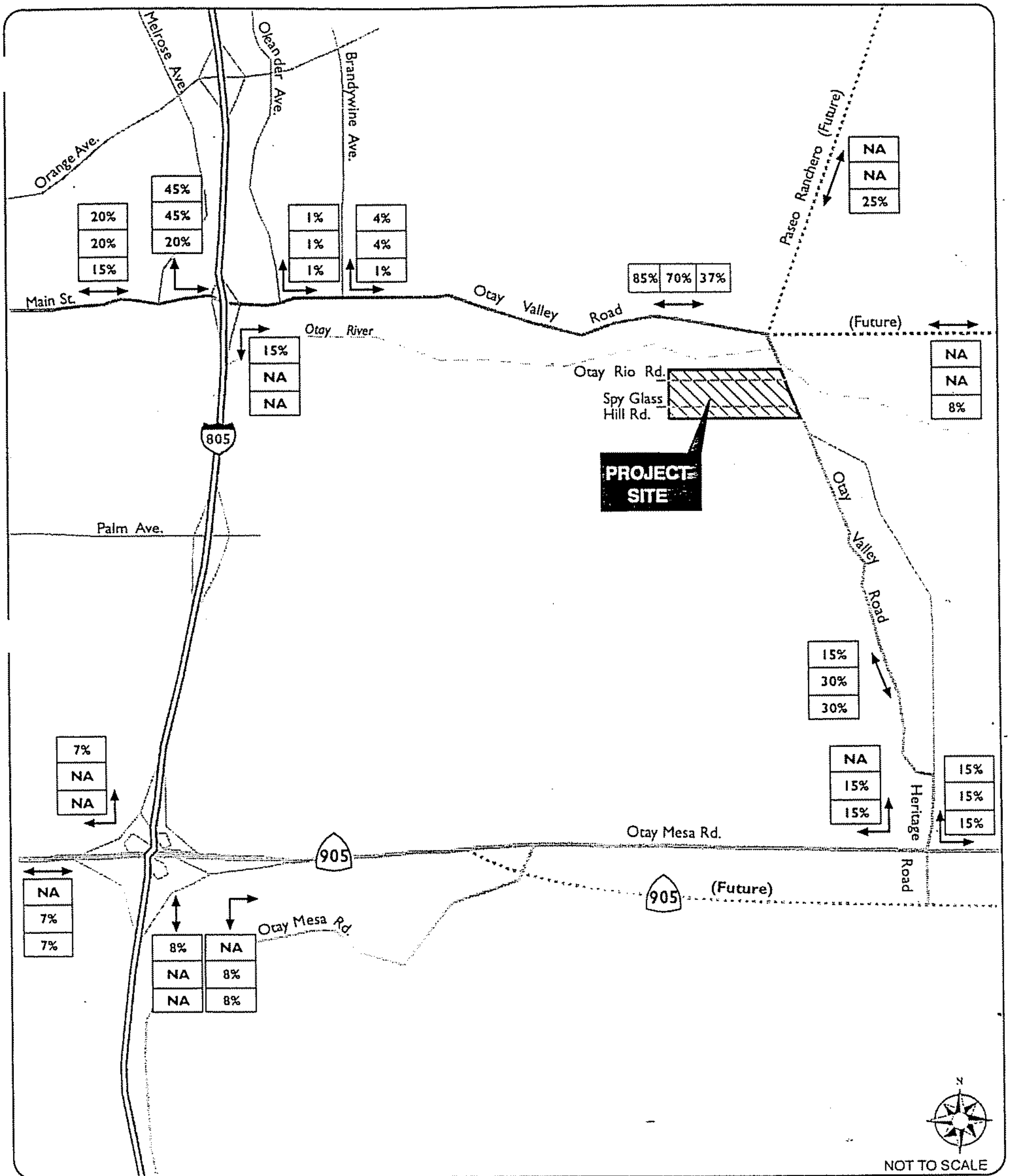
Summary of arrival and departure factors:
(1) 20% of Total Enter +1 hr before
(2) 55% of Total Enter 0-1 hr before
(3) 25% of Total Enter 0+hrs. after
(4) 65% of Total Exit
(5) 35% of Total Exit

## 3.3 TRIP DISTRIBUTION

Distribution of trips to and from the site was developed by BRW based on available data from previous traffic studies as well as model output from the SANDAG Series 8 model forecasts. Traffic studies conducted for the Auto Mall were also reviewed for trip distribution assumptions since the Mall is expected to draw trips from a wide area of the subregion similar to the amphitheater and the open-air market.

In addition to the review of previous studies, a select zone model run for the area including the MCA project site was obtained from SANDAG for future Year 2010 conditions. The model run was used to assist with the development of anticipated trip distribution assumptions for Interim Year 2010 and Buildout Conditions. With the exception of Heritage Road/Otay Valley Road, which will be a two-lane facility under Opening Day Conditions, the Year 2010 street network is essentially the same as Opening Day 1996 conditions. This facility is planned to be improved to a six-lane prime arterial according to the Chula Vista General Plan. Thus, this analysis assumes that this facility will be improved to at least a four-lane facility under Year 2010 conditions.

Figure 8 presents the trip distribution percentages assumed for the site. It should be noted that the amphitheater is assumed to be a regional destination such that trips from the U.S. as well as Mexico are expected to access the site. Therefore, a portion of the trips generated by the site are assumed to be attracted from the Otay Mesa and the San Ysidro border crossing points.

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| | |
|---|---|
| XX | 1996 OPENING DAY |
| YY | 2010 INTERIM |
| ZZ | BUILDOUT |

Figure 8
## Site Trip Distribution

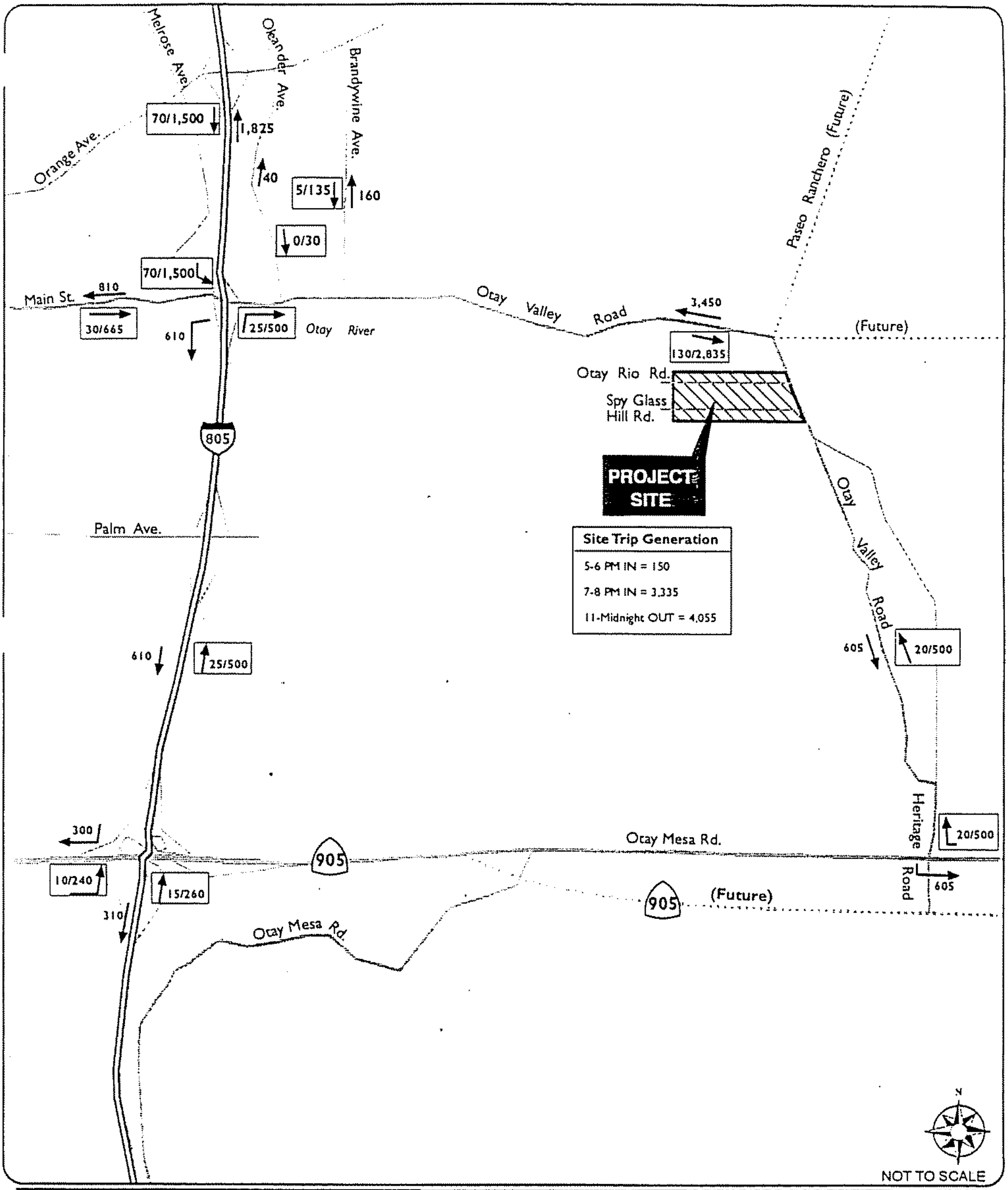
Source: BRW, Inc.;April 26, 1995

## 3.4 TRIP ASSIGNMENT

Using the trip distribution pattern presented on Figure 8 and trip generation assumptions presented below and in Table 6, trips were assigned to the surrounding network for three time periods as follows:

5:00 to 6:00 p.m. - Peak Hour of the street system
7:00 to 8:00 p.m. - For the Peak Hour before curtain
11:00 to 12:00 p.m. - For the Peak Exit Hour

Different trip assignments were developed for Opening Day, Interim Year 2010 and Buildout conditions based on trip generation and distribution assumptions. Figure 9 illustrates Opening Day 1996 site volumes, while Figure 10 presents Interim Year 2010 site traffic volumes. These figures illustrate the volume differences along Heritage/Otay Valley Road assuming street network improvements are made between the two time periods. Buildout site volumes are illustrated in Figure 11. All trip assignments assume an 8:00 p.m. curtain.

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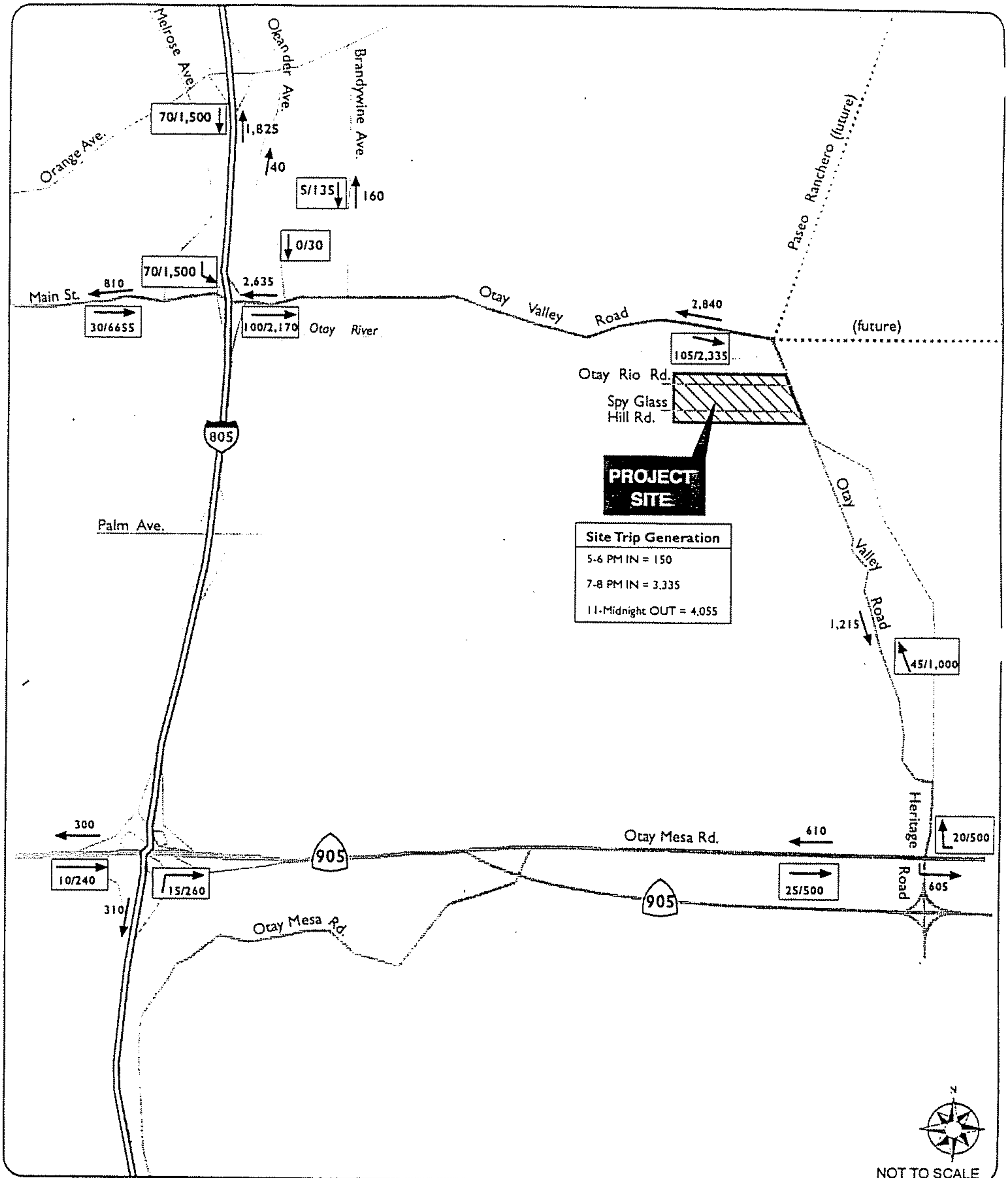
XX/XX INBOUND
5-6 PM 7-8 PM

XX/XX OUTBOUND
11 PM-Midnight

Figure 9

**Opening Day 1996**
**Site Volumes**
*Assumes 8:00 P.M. Curtain*

Source: BRW, Inc.; April 26, 1995

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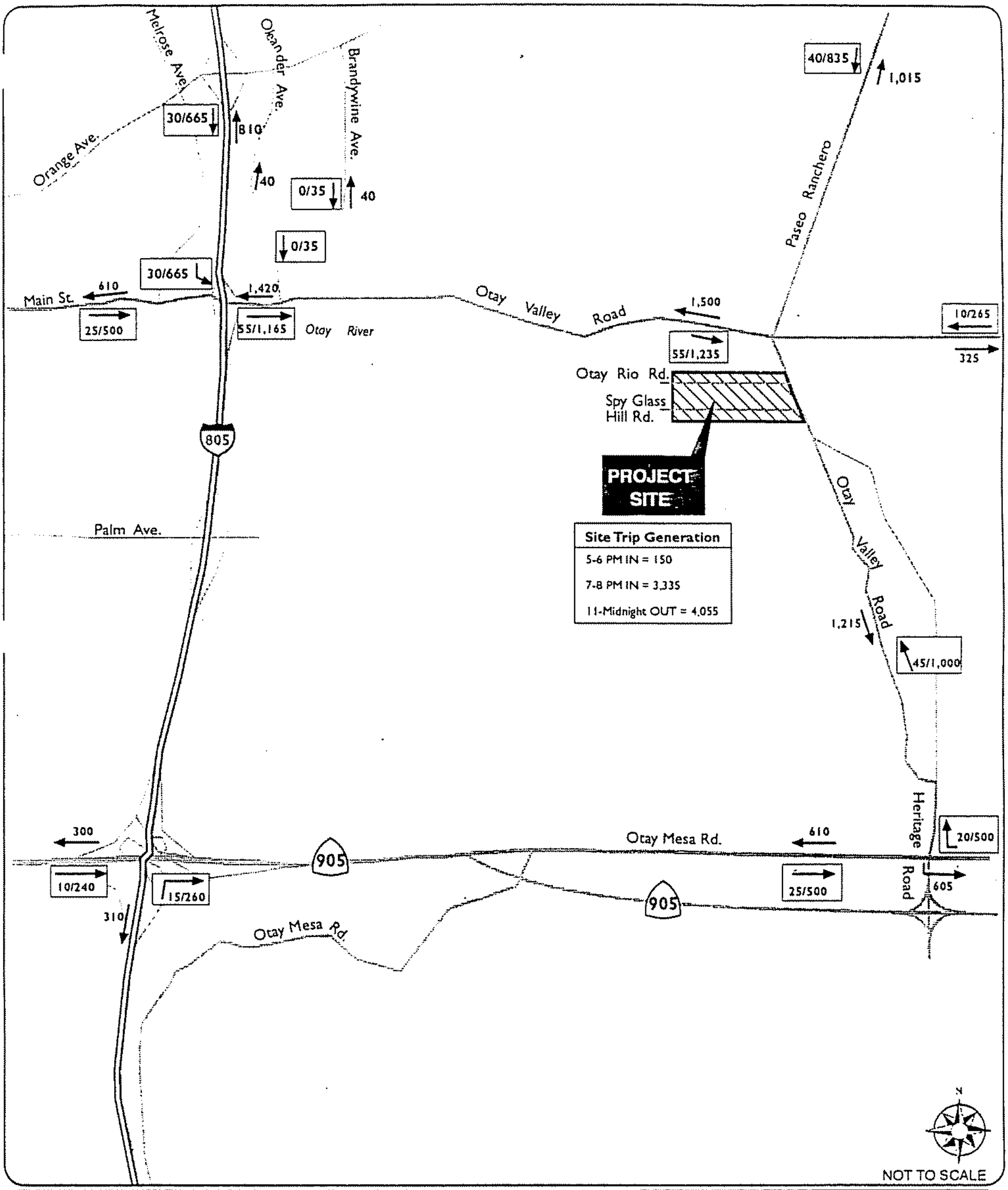
| | |
|---|---|
| XX/XX<br>5-6 PM 7-8 PM | INBOUND |
| XX/XX<br>11 PM-Midnight | OUTBOUND |

Figure 1(

**Year 2010**
**Interim Site Volumes**
*Assumes 8:00 P.M. Curtain*

Source: BRW, Inc.; April 26, 1995

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| | |
|---|---|
| XX/XX<br>5-6 PM 7-8 PM | INBOUND |
| XX/XX<br>11 PM-Midnight | OUTBOUND |

Figure 11
## Buildout Site Volumes
*Assumes 8:00 P.M. Curtain*

Source: BRW, Inc.; April 26, 1995

# 4.0 Opening Day Conditions - 1996

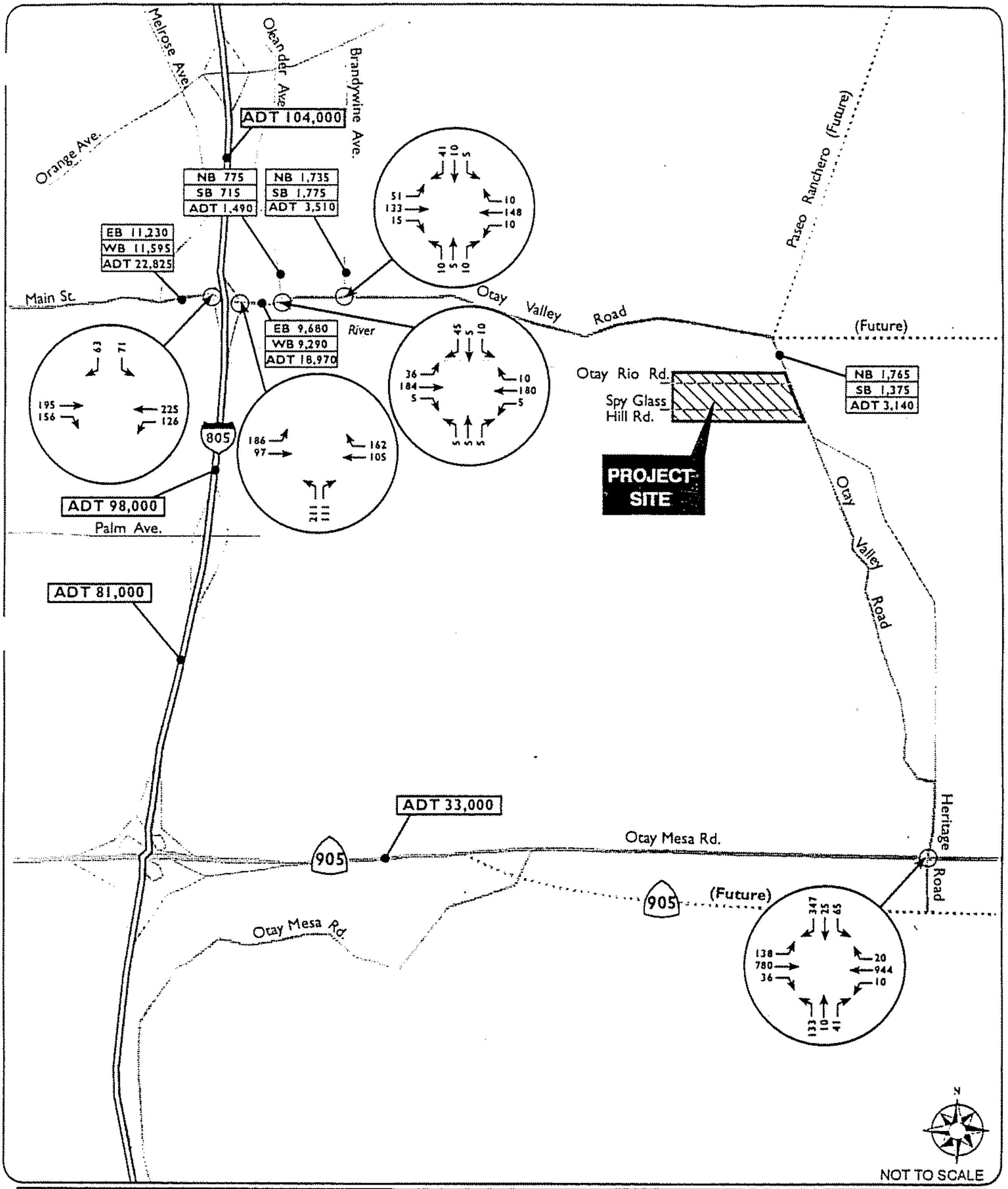
This Chapter presents the expected conditions for the Amphitheater facility on Opening Day in 1996. Prior to discussing future conditions with the project, background conditions with no project are described to form a baseline and facilitate the identification of project-related traffic impacts. Forecasted levels of service are presented for Otay Valley Road, the I-805 interchange at Otay Valley Road/Main Street and selected intersections. Conceptual mitigation measures are also presented for those network elements expected to operate at an unacceptable level of service.

## 4.1 BACKGROUND (NO PROJECT) CONDITIONS

Traffic volumes from previous studies which conducted counts on Otay Valley Road indicate that traffic volumes have been increasing at a rate of approximately 1.0 to 1.5 percent per year. Opening Day traffic volumes in the vicinity of the project site were developed by factoring the existing counts to account for traffic growth between 1995 and 1996. This study assumes a 2.0 percent growth rate, which reflects a conservative approach. Figure 12 presents the background traffic volumes for 1996.

## 4.2 BACKGROUND PLUS PROJECT CONDITIONS

The trips generated from the project site were added to the background volumes to determine the hours with the highest traffic volume totals. The combination of the background volumes with the project site volumes results in different levels of traffic during the different evening periods. The amphitheater facility type is such that the timing of the events results in the highest amount of site traffic occurring after the highest level of background traffic on the adjacent street system has past.

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| | |
|---|---|
| XXX / XXX / XXX | Average Daily Traffic by Direction and Total |
| XX | 7-8 PM Turning Movements |

Figure 12
# Opening Day 1996 Background Volumes



Source: City of Chula vista, BRW, Inc.;April 26, 1995

Adding the background traffic to the site traffic during the three previously defined periods (5:00-6:00 p.m.; 7:00-8:00 p.m.; 11:00-12:00 a.m.) shows the hour with the highest overall volume to be from 7:00 to 8:00 p.m. For this reason, this period was taken as the detailed analysis period for level of service calculations. The following sections present the level of service analysis for roadway segments, the I-805/Otay Valley Road interchange and selected intersections.

## Roadway Segment Level of Service

Table 7 presents the results of the roadway level of service analysis based on the defined City standards for both the background (no project) and with project conditions on Opening Day. As indicated in Table 7, acceptable roadway levels of service would result with the facility in operation. No mitigation is necessary.

TABLE 7
ROADWAY SEGMENT LEVEL OF SERVICE
OPENING DAY 1996 CONDITIONS

| Segment | Facility Type | LOS C Capacity | Existing | | Opening Day 1996 Background | | Opening Day With Project | |
|---|---|---|---|---|---|---|---|---|
| | | | ADT | LOS | ADT | LOS | ADT | LOS |
| *Otay Valley Road* | | | | | | | | |
| Melrose to I-805 Southbound Ramps | 4-Lane Major | 30,000 | 22,380 | A | 22,825 | B | 24,890 | B |
| I-805 Northbound Ramps to Oleander Avenue | 6-Lane Prime | 50,000 | 18,600 | A | 18,970 | A | 27,245 | A |
| Brandywine Avenue to Nirvana Avenue | 6-Lane Prime | 50,000 | 3,080 | A | 3,140 | A | 11,930 | A |

SOURCE: City of Chula Vista; BRW, Inc.; April 1995.

## Freeway Segment Level of Service

Level of service performance for I-805 and SR-905 are also presented to document existing conditions. These traffic volumes and corresponding level of service are shown in Table 8.

TABLE 8
FREEWAY LEVELS OF SERVICE
1995 EXISTING AND 1996 OPENING DAY CONDITIONS

| Facility/Segment | LOS E Capacity | Existing | | Opening Day 1996 Background | | Opening Day with Project | |
|---|---|---|---|---|---|---|---|
| | | ADT | LOS | ADT | LOS | ADT | LOS |
| *I-805* | | | | | | | |
| Orange Avenue to Otay Valley Road | 160,000 | 102,000 | C | 104,100 | C | 109,550 | C |
| Otay Valley Road to Palm Avenue | 160,000 | 96,000 | B | 97,900 | B | 99,720 | C |
| Palm Avenue to SR-905 | 160,000 | 79,000 | B | 80,600 | B | 82,420 | B |
| *SR-905* | | | | | | | |
| I-805 to Otay Mesa Road | 80,000 | 32,000 | B | 32,700 | B | 32,700 | B |

SOURCE: Caltrans; BRW, Inc.; May 1995.

## I-805/Otay Valley Road Interchange

Since the I-805/Otay Valley Road interchange is the major point of access to the facility site for the majority of trips, each of the turning movements at the interchange was studied in detail. Table 9 shows the results of this analysis for Opening Day background with and without project conditions.

# TABLE 9
## I-805/OTAY VALLEY ROAD - MAIN STREET INTERCHANGE
## OPENING DAY 1996 LEVELS OF SERVICE
## (7:00 - 8:00 P.M.)

| Movement | 1995 Movement Count Volumes | Opening Day 1996 Background | | | Opening Day 1996 With Project | | |
|---|---|---|---|---|---|---|---|
| | | Movement Volumes | Delay | LOS | Movement Volumes | Delay | LOS |
| *Northbound Ramps* | | | | | | | |
| Northbound Left/Through | 207 | 211 | 14.2 | B | 211 | 16.8 | C |
| Northbound Right | 109 | 111 | 12.0 | B | 611 | 34.0 | D |
| Eastbound Left | 182 | 186 | 13.6 | B | 186 | 21.6 | C |
| Eastbound Through | 95 | 97 | 2.2 | A | 2,262 | 36.3 | D |
| Westbound Right | 159 | 162 | 9.8 | B | 162 | 10.5 | B |
| Westbound Through | 103 | 105 | 8.8 | B | 105 | 9.5 | B |
| Intersection Total | | | 11.0 | B | | 32.0 | D |
| *Southbound Ramps* | | | | | | | |
| Southbound Left/Through | 70 | 71 | 13.5 | B | 1,571 | * | F |
| Southbound Right | 62 | 63 | 13.2 | B | 63 | 13.3 | B |
| Eastbound Right | 153 | 156 | 6.5 | B | 156 | 6.6 | B |
| Eastbound Through | 191 | 195 | 6.1 | B | 860 | 7.3 | B |
| Westbound Left | 124 | 126 | 15.2 | C | 126 | 15.4 | C |
| Westbound Through | 221 | 225 | 1.7 | A | 225 | 1.7 | A |
| Intersection Total | | | 7.5 | B | | * | F |

SOURCE: Southland Car Counters; BRW, Inc.; April 1995.

NOTES: * Delay is unreasonably high.
Bold type indicates movements (or intersection as a whole) operating at an unacceptable level of service.

As expected, the high southbound exit ramp movement to turn eastbound results in considerable delays for southbound traffic and a corresponding unacceptable level of service for the southbound ramp intersection (LOS F). The east portion of the interchange (northbound ramp intersection) does not drop below LOS D for any movement.

The Caltrans Project Study Report (PSR) prepared for the I-805/Otay Valley Road interchange improvements indicates that the southbound left-turn movement from the freeway will be shared with the through movement in a single lane. To examine the effect of a double left-turn lane for this movement, Table 10 was prepared and focuses on the southbound ramps. As indicated in Table 10, the southbound left-turn movement could be improved from LOS F to LOS B with the use of an exclusive left-turn lane and a shared left/through/right center lane. The double left-turn could be provided as mitigation by revising the planned geometric striping to provide for the exclusive left-turn lane and allowing left-turns, right-turns and through movements to be made from the center lane.

TABLE 10
I-805/OTAY VALLEY ROAD - MAIN STREET INTERCHANGE
OPENING DAY 1996 CONDITION LEVELS OF SERVICE
MITIGATED INTERSECTION GEOMETRICS
(7:00 - 8:00 P.M.)

| Movement | 1995 Movement Count Volumes | Opening Day 1996 With Project | | | | | |
|---|---|---|---|---|---|---|---|
| | | Movement Volumes | Planned Geometrics | | Mitigated Geometrics ** | |
| | | | Delay | LOS | Delay | LOS |
| *Southbound Ramps* | | | | | | |
| Southbound Left/Through<br>Southbound Right | 70<br>62 | **1,571**<br>63 | *<br>13.3 | **F**<br>B | <br>13.0 | <br>B |
| Eastbound Right<br>Eastbound Through | 153<br>191 | 156<br>860 | 6.6<br>7.3 | B<br>B | 13.8<br>15.5 | B<br>C |
| Westbound Left<br>Westbound Through | 124<br>221 | 126<br>225 | 15.4<br>1.7 | C<br>A | 21.7<br>6.8 | C<br>B |
| Intersection Total | | | * | **F** | 13.7 | B |

SOURCE: Southland Car Counters; BRW, Inc.; April 1995.

NOTES:
* Delay is unreasonably high.
** Mitigated geometrics include an exclusive southbound off-ramp left turn and right turn lane and a shared center left turn/right turn/through lane. The shared utilization of the center lane results in the level of service and delay reporting for all movements on the southbound approach.

Bold type indicates movements (or intersection as a whole) operating at an unacceptable level of service.

## Intersection Levels of Service

Three other major intersections were studied for potential impacts to traffic operations. The intersections of Oleander and Brandywine Avenues with Otay Valley Road and the intersection of Heritage Road with Otay Mesa Road were examined. The results of these calculations are presented in Table 11. As indicated in Table 10, all intersections are expected to operate at an acceptable LOS C or better with the facility in operation. No mitigation is necessary. Appendices B and C contain peak hour intersection capacity analysis worksheets for the I-805 ramps and critical intersections under Opening Day 1996 conditions with and without the project.

TABLE 11
INTERSECTION LEVELS OF SERVICE
OPENING DAY 1996 CONDITION
(7:00 - 8:00 P.M.)

| Intersection | Opening Day 1996 Background | | Opening Day 1996 With Project | |
|---|---|---|---|---|
| | Delay | LOS | Delay | LOS |
| Oleander Avenue/Otay Valley Road | 9.0 | B | 13.6 | B |
| Brandywine Avenue/Otay Valley Road | 9.9 | B | 17.3 | C |
| Heritage Road/Otay Mesa Road | 20.4 | C | 19.9 | C |

SOURCE: BRW, Inc.; April 1995.

# 5.0 Interim Year Conditions - 2010

This Chapter provides a description of network performance under Interim Year 2010 conditions for both background (no project) and with project traffic conditions. This interim timeframe is analyzed in order to assess the worst case scenario in which the street network would be most constrained. As was done for Opening Day conditions, future background conditions with no project are discussed to set the baseline for the evaluation of traffic impacts. Project-related impacts can be determined based upon the comparison with background site conditions. Roadway segment, the I-805/Otay Valley Road interchange, and selected intersection levels of service are presented under interim conditions.

This chapter also provides a discussion on Interim Year 2010 and Year 2015 freeway segment performance and concludes with a discussion of the cumulative network impacts under full Southbay Buildout conditions.

## 5.1 BACKGROUND CONDITIONS - 2010 (NO PROJECT)

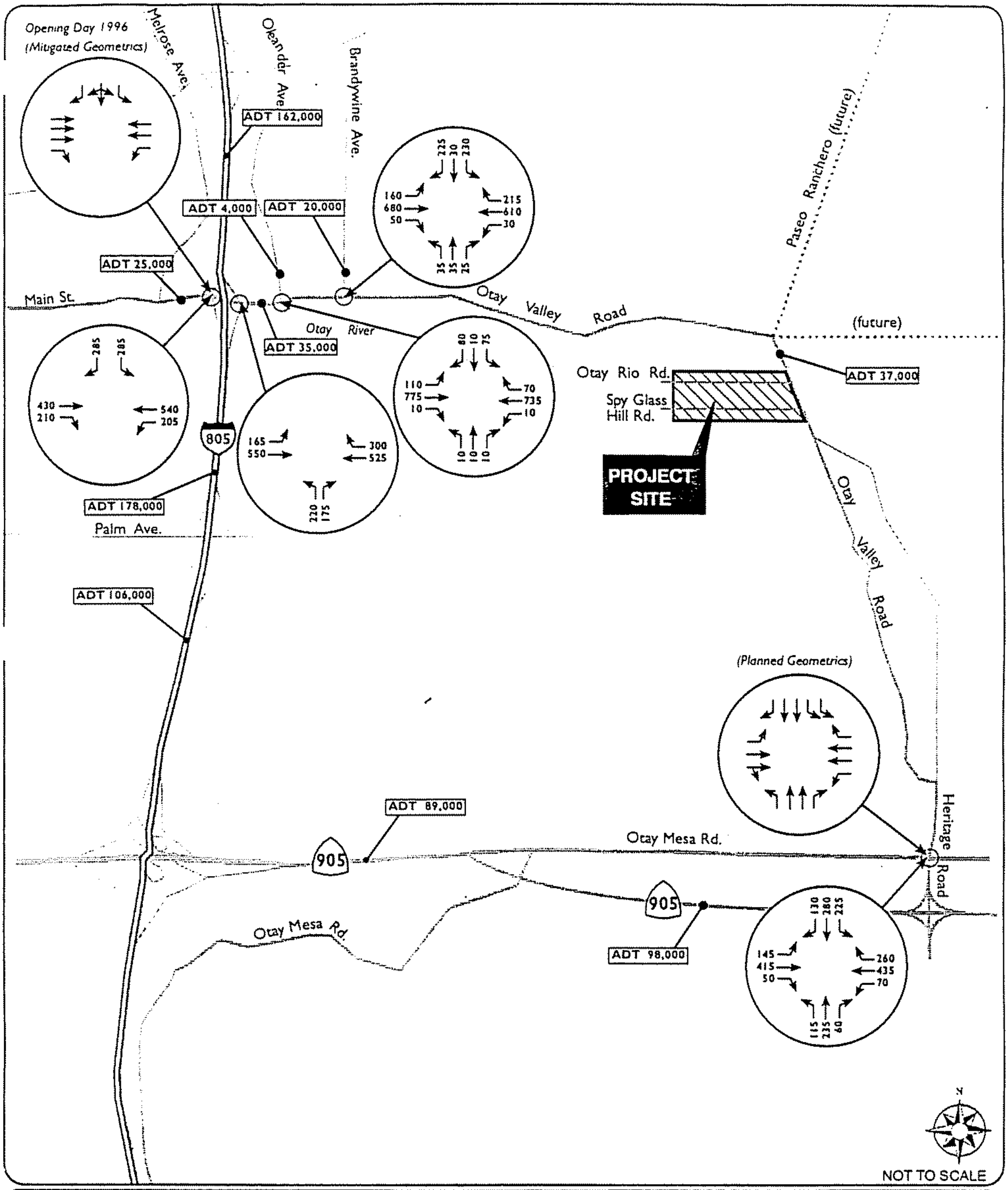
The future year 2010 was selected as the interim analysis year because the street and highway network is still expected to be fairly limited in the area surrounding the MCA Amphitheater site. The Year 2010 network is not expected to have any roadways connecting to the east or north from the project site by 2010.

The Year 2010 network is based on the planning work that is currently underway in Southbay communities and the County of San Diego. The largest planning project is the staged development of the Otay Ranch master planned community situated north and east of the site. Once the Otay Ranch development warrants additional capacity and linkages, roadways will be constructed to the south into Otay Mesa, and connections to the east and north for the amphitheater site will be provided. These connections are expected after year 2010.

One significant network improvement will be the construction of Otay Valley Road/ Heritage Road from Nirvana Avenue south to Otay Mesa Road as a four-lane major street. This improvement will help to better distribute site-related traffic.

The Year 2010 Background Conditions baseline was selected to be consistent with the planning work for Otay Ranch. Work is currently underway to conduct the Otay Ranch Sectional Planning Area (SPA) One Transportation Study. The Otay Ranch SPA One study uses the SANDAG regional travel demand forecasting model and the Series 8 socioeconomic forecasts that have been adopted for the region. Thus, BRW utilized modeling work conducted by SANDAG for the Otay Ranch SPA One Transportation Study. These model runs included detailed projections of land use and network configurations within the Southbay area under Year 2010 conditions. Assumptions related to the level of cumulative development were included in the regional model for eastern Chula Vista, Otay Mesa in the City of San Diego and eastern Otay Mesa in the County of San Diego. Additionally, the SANDAG Series 8 model includes Year 2015 forecasts for the remainder of the region including projected levels of border crossings.

Traffic forecasts for the Otay Ranch SPA One were obtained for the amphitheater study area to serve as a consistent base for comparison with other studies. Figure 13 illustrates the daily and evening peak hour volumes for Interim Year 2010 conditions. As shown in Figure 13, these volumes exhibit significant growth compared to the Opening Day 1996 volumes as would be expected for the 14-year period between the two analysis timeframes. Growth in ADT volumes on Otay Valley Road near I-805 is expected to be between 80 to 85 percent while growth near the amphitheater site is expected to be much higher at over 1,000 percent because of the low existing volumes.

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| | |
|---|---|
| XXX | Average Daily Traffic |
| XX | 7-8 PM Turning Movements |

Figure 13
**2010 Interim Background Volumes**

Source: SANDAG, BRW, Inc.; April 26, 1995

## 5.2 BACKGROUND PLUS PROJECT CONDITIONS

As was done for the Opening Day conditions analysis, the Year 2010 site traffic for the highest hour associated with the facility was added to the background traffic volumes. As stated previously, the hour from 7:00 p.m. to 8:00 p.m. on Friday was selected for detailed analysis. Level of service analyses were performed for roadway segments, the I-805/Otay Valley Road interchange and selected intersections consistent with the analyses performed for Opening Day conditions.

### Roadway Level of Service

Table 12 presents the results of the roadway level of service analysis using the City standards. The table presents both the with and without project conditions.

The table indicates that acceptable roadway levels of service would result with the facility in operation. Only one segment falls below LOS C with the site in place. this segment is from the river to Otay Mesa Road along Heritage Road. The expected volumes also exceed the threshold without the project. In order to examine the affect of the amphitheater site on Heritage Road the specific intersection operations must be examined. Because the peak period of the site is much later than the peak period of the roadway, the segment level of service is of lesser concern.

TABLE 12
ROADWAY SEGMENT LEVEL OF SERVICE
INTERIM YEAR 2010 CONDITIONS

| Segment | Facility Type | LOS C Capacity | Interim Year 2010 Background | | Interim Year 2010 With Project | |
|---|---|---|---|---|---|---|
| | | | ADT | LOS | ADT | LOS |
| *Otay Valley Road* | | | | | | |
| Melrose to I-805 Southbound Ramps | 4-Lane Major | 30,000 | 25,000 | B | 27,065 | C |
| I-805 Northbound Ramps to Oleander Avenue | 6-Lane Prime | 50,000 | 35,000 | A | 41,725 | B |
| Brandywine Avenue to Nirvana Avenue | 6-Lane Prime | 50,000 | 39,000 | B | 46,240 | C |
| *Otay Valley Road/Heritage Road* | | | | | | |
| Nirvana Avenue to Otay Mesa Road | 4-Lane Major | 30,000 | 36,000 | E | 39,770 | F |

SOURCE: BRW, Inc.; May 1995.

## Freeway Segment Level of Service

Table 13 presents interim year 2010 freeway ADT volumes and future levels of service for I-805 and SR-905 both with and without the project. Although daily traffic volumes increase slightly on two segments, level of service performance remains the same under with project conditions.

TABLE 13
FREEWAY LEVELS OF SERVICE
YEAR 2010 INTERIM CONDITIONS

| Facility/Segment | LOS E Capacity | Interim 2010 Background | | Interim 2010 with Project | |
|---|---|---|---|---|---|
| | | ADT | LOS | ADT | LOS |
| *I-805* | | | | | |
| Orange Avenue to Otay Valley Road | 160,000 | 162,000 | F | 167,450 | F |
| Otay Valley Road to Palm Avenue | 160,000 | 178,000 | F | 178,000 | F |
| Palm Avenue to SR-905 | 160,000 | 106,000 | C | 106,000 | C |
| *SR-905* | | | | | |
| I-805 to Heritage Road | 120,000 | 98,000 | D | 99,820 | D |

SOURCE: Caltrans; BRW, Inc.; May 1995.

## I-805/Otay Valley Road Interchange

With the exception that Heritage Road/Otay Valley Road will be improved from a two-lane facility to at least a four-lane facility by Year 2010, trip patterns will remain largely unchanged between the Opening Day 1996 and Interim Year 2010 conditions. The primary difference will be an increase in northbound trips from the Otay Mesa area from Otay Mesa Road and continuing north via Heritage Road/Otay Valley Road. However, the I-805 interchange at Otay Valley Road will remain the major point of access to the facility for most trips. Similar to the Opening Day analysis, each of the turning movements at the interchange was studied in detail. Table 14 presents the results of this analysis.

## TABLE 14
## I-805/OTAY VALLEY ROAD - MAIN STREET INTERCHANGE
## INTERIM YEAR 2010 CONDITION LEVELS OF SERVICE
## (7:00 - 8:00 P.M.)

| Movement | Interim Year 2010 Background | | | Interim Year 2010 With Project | | |
|---|---|---|---|---|---|---|
| | Movement Volume | Delay | LOS | Movement Volume | Delay | LOS |
| *Northbound Ramps* | | | | | | |
| Northbound Left/Through | 220 | 17.4 | C | 220 | **45.1** | **E** |
| Northbound Right | 175 | 13.5 | B | 175 | 30.1 | D |
| Eastbound Left | 165 | 13.3 | B | 165 | 31.9 | D |
| Eastbound Through | 550 | 2.1 | A | 2,715 | 37.6 | D |
| Westbound Right | 300 | 10.7 | B | 300 | 10.1 | B |
| Westbound Through | 525 | 8.8 | B | 525 | 8.9 | B |
| Intersection Total | | 9.0 | B | | 31.8 | D |
| *Southbound Ramps* | | | | | | |
| Southbound Left/Through | 285 | 10.4 | B | **1,785** | * | **F** |
| Southbound Right | 285 | 9.3 | B | 285 | 11.0 | B |
| Eastbound Right | 210 | 14.2 | B | 210 | 15.4 | C |
| Eastbound Through | 430 | 12.1 | B | 1,095 | 18.2 | C |
| Westbound Left | 205 | 15.5 | C | 205 | 24.9 | C |
| Westbound Through | 540 | 4.7 | A | 540 | 6.7 | B |
| Intersection Total | | 10.0 | B | | * | **F** |

SOURCE: BRW, Inc.; April 1995.

Notes: * Reported HCM delay is unreasonably high.
Bold type indicates intersection operating at unacceptable level of service.

As expected from the analysis of Opening Day, the high southbound exit ramp movement to turn eastbound or continue through continues to cause long delays for the southbound traffic and unacceptable levels of service for the southbound ramp intersection (LOS F). The northbound ramp intersection continues to operate at LOS D although the northbound left/through movement drops to an unacceptable LOS E.

The southbound left-turn from the freeway would still be a single lane in 2010. To examine the effect of a double-left turn lane for this movement, Table 15 was prepared focusing on the southbound ramps. The results in the table show that the southbound left-turn could be raised to LOS D from LOS F with the use of an exclusive left-turn lane and a shared left/through/right turn lane during the events. Figure 13 illustrates the mitigated geometrics at the southbound ramps for the southbound left, through and right-turn movements.

### TABLE 15
### I-805/OTAY VALLEY ROAD - MAIN STREET INTERCHANGE
### INTERIM YEAR 2010 CONDITION LEVELS OF SERVICE
### MITIGATED INTERSECTION GEOMETRICS
### (7:00 - 8:00 P.M.)

| Movement | Interim Year 2010 With Project | | | | |
|---|---|---|---|---|---|
| | Movement Volumes | Planned Geometrics | | Mitigated Geometrics | |
| | | Delay | LOS | Delay | LOS |
| *Southbound Ramps* | | | | | |
| Southbound Left/Through | 1,785 | * | F | | |
| Southbound Right | 285 | 11.0 | B | 29.5 | D |
| Eastbound Right | 210 | 15.4 | C | 26.2 | D |
| Eastbound Through | 1,095 | 18.2 | C | 33.9 | D |
| Westbound Left | 205 | 24.9 | C | 39.3 | D |
| Westbound Through | 540 | 6.7 | B | 13.3 | B |
| Intersection Total | | * | F | 28.8 | D |

SOURCE: BRW, Inc.; April 1995.

Notes: * Delay is unreasonably high.

** Mitigated geometrics include an exclusive southbound off-ramp left turn and right turn lane and a shared center left turn/right turn/through lane. The shared utilization of the center lane results in the level of service and delay reporting for all movements on the southbound approach.

Bold type indicates movements (or intersection as a whole) operating at an unacceptable level of service.

It is interesting to note that the expected operations without the project (background with no project) would be at LOS F for the southbound left-turn which causes the entire intersection to operate at LOS F. With the double-left turn lane for southbound traffic, this movement and the entire intersection improves to LOS D. However, this improvement comes as a result of the degradation in operations for the following movements:

| | |
|---|---|
| Eastbound Right - | From LOS C to LOS D |
| Eastbound Through - | From LOS C to LOS D |
| Westbound Left - | From LOS C to LOS D |

Thus, although the overall intersection delay is improved, it comes at the expense of these other movements. While no mitigation is necessary for the southbound ramps assuming mitigated geometrics are in place and LOS is raised to an acceptable LOS D, mitigation treatments in the form of traffic control during events may need to be applied to mitigate the unacceptable LOS E expected at the northbound ramp for the left/through movement. These techniques are discussed in the following chapter.

Appendices D and E contain peak hour intersection capacity analysis worksheets for Interim Year 2010 background and with project conditions, respectively, for the I-805 ramps and the intersections analyzed below. Appendix F presents the worksheets under Interim Year 2010 with project mitigated conditions for the I-805 southbound ramps.

**Intersection Levels of Service**

Between Opening Day and the Year 2010, several network improvements will be made including:

- Otay Valley Road/Heritage Road - widen to four-lane major street from Nirvana Avenue to Otay Mesa Road. (Note: this street will be renamed Paseo Ranchero.)
- Otay Mesa Road - widen to four-lane major street.

- SR-905 - Construct freeway.
- I-805/Otay Valley Road Interchange - upgrade intersections.

Three additional major intersections were studied for potential impacts to traffic operations. Similar to the Opening Day analysis, the intersections of Oleander and Brandywine Avenues with Otay Valley Road and the intersection of Heritage Road with Otay Mesa Road were examined. Intersection geometrics were assumed consistent with the SANDAG model. For example, the Otay Mesa/Heritage Road intersection is assumed to have been improved with the addition of turn lanes between the Opening Day and Year 2010 time periods. The results of these calculations are presented in Table 16.

TABLE 16
INTERSECTION LEVELS OF SERVICE
INTERIM YEAR 2010 CONDITION
(7:00 - 8:00 P.M.)

| Intersection | Interim Year 2010 Background | | Interim Year 2010 With Project | |
|---|---|---|---|---|
| | Delay | LOS | Delay | LOS |
| Oleander Avenue/Otay Valley Road | 11.0 | B | 14.6 | B |
| Brandywine Avenue/Otay Valley Road | 14.8 | B | 39.5 | D |
| Heritage Road/Otay Mesa Road | 20.4 | C | 39.7 | D |

SOURCE: BRW, Inc.; April 1995.

The above analysis indicates that none of the intersections are expected to operate below the acceptable level of service threshold (LOS D) when project traffic is added. Therefore, no impacts were found and no mitigation is necessary. It should be recognized that this analysis is based on planned geometrics at the Heritage Road/Otay Mesa Road intersection as shown in Figure 13.

## 5.3 DISCUSSION OF BUILDOUT CONDITIONS WITH OTAY RANCH

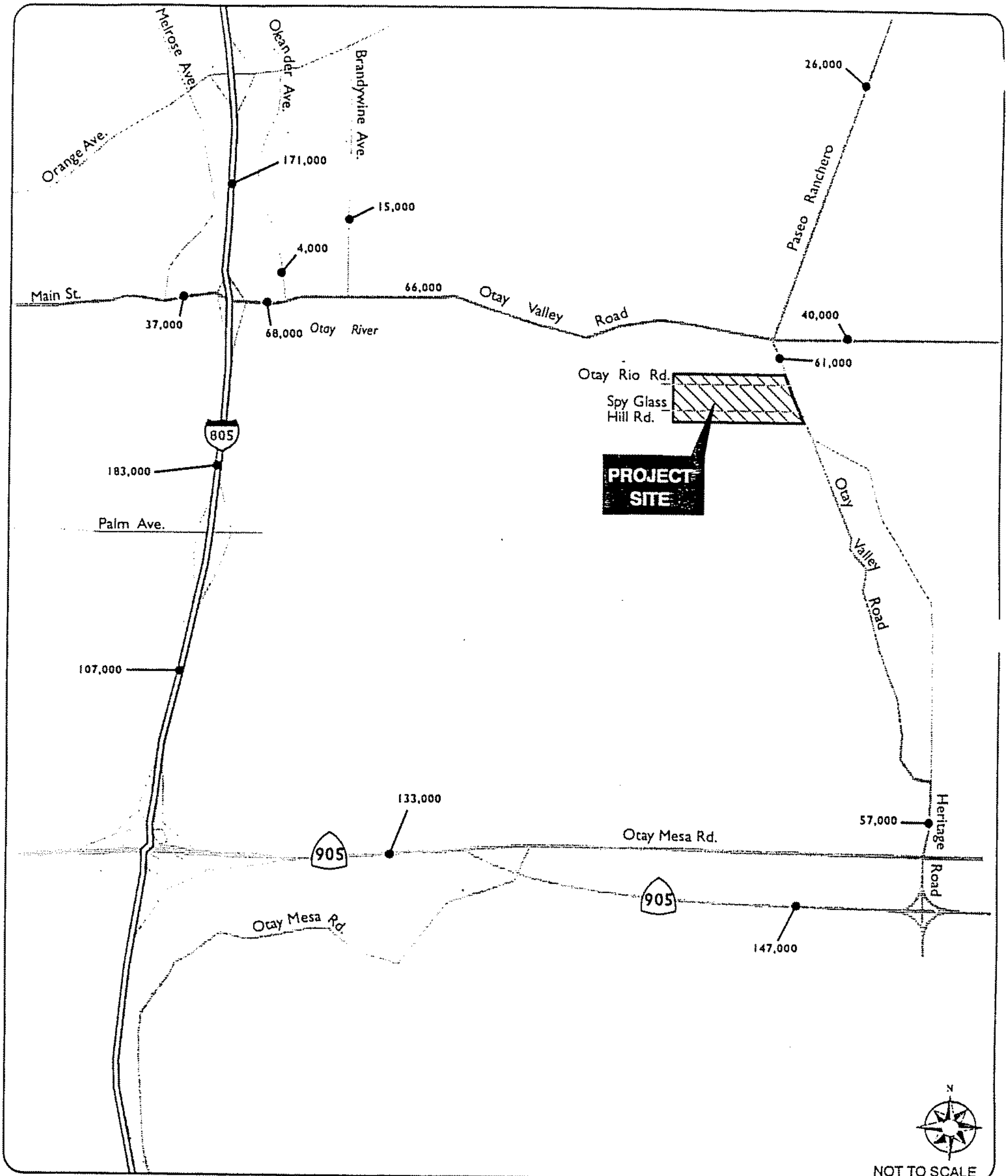
This section provides an overview of cumulative impacts under full Southbay Buildout conditions. Under full buildout of the Southbay, including the Otay Ranch Project, the amphitheater will continue to function as a special event center operating approximately 35 to 60 times per year. Buildout is expected sometime after Year 2015.

The background volumes for the Southbay region increase dramatically under Buildout conditions due to the significant amount of development to the north and east of the site. The special event characteristic of the facility will continue to add a substantial amount of traffic to the surrounding roadway network during the evening time periods. This project generated traffic, however, is concentrated in the two hours prior to an event which is after the peak hour of the surrounding street system and within two hours after the event.

Buildout traffic volumes forecasted by the SANDAG Series 8 Traffic Model (Version 1.0) are included on Figure 14. These volumes are much higher than the Interim Year 2010 forecasted volumes due to substantial development in the Southbay area including but not limited to the full buildout of Otay Ranch and Otay Mesa.

Under Buildout conditions, a number of roadway network improvements have been made to accommodate the future development in this area. With these improvements, two new directions are available for event use:

- North into Otay Ranch via Paseo Ranchero
- East into Otay Ranch via Otay Valley Road, linking with SR-125

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XXX Buildout Forecast Average Daily Traffic

Figure 1-

Buildout Volumes

Source: SANDAG; BRW, Inc.; April 26, 1995

These two new directions serve to further distribute site traffic and will substantially reduce event volumes on I-805 and Otay Valley Road below those volumes expected in Year 2010. Traffic operations are expected to be acceptable under Buildout conditions. Furthermore, because of the mature network in the buildout timeframe (post-2015), event traffic will be easier to handle than under Interim Year 2010 conditions, which assumes a much more limited circulation network. Therefore, the Year 2010 Interim condition was determined to be more severe and was studied in detail as the most conservative approach to the traffic analysis.

**Freeway Operations - Post Year 2015**

Although Caltrans utilizes Year 2015 as the transportation planning horizon year, BRW selected Year 2010 as it represents the "worst case" scenario. Interim Year 2010 reflects a limited circulation network without connections to the east and north from the project site and without future SR-125 in place.

By Year 2015, the major roadways in the Southbay area are planned to be in place. These include:

- SR-125 - Four-lane freeway
- Paseo Ranchero - Six-lane Prime Arterial
- Otay Valley Road - Six-lane Prime Arterial extended east to an interchange at SR-125

For informational purposes intended to complement Caltrans freeway planning efforts, Table 17 provides future Year 2015 ADT volumes and associated LOS for freeway segments in the vicinity of the project site. Although long-range planning efforts indicate that I-805 will eventually be a 10-lane facility, this analysis assumes I-805 will remain an 8-lane facility in Year 2015.

TABLE 17
FREEWAY LEVELS OF SERVICE
YEAR 2015 CONDITIONS

| Facility/Segment | LOS E Capacity | Year 2015 Background | | Year 2015 with Project | |
|---|---|---|---|---|---|
| | | ADT | LOS | ADT | LOS |
| *I-805* | | | | | |
| Orange Avenue to Otay Valley Road | 160,000 | 151,000 | D | 156,450 | E |
| Otay Valley Road to Palm Avenue | 160,000 | 157,000 | E | 157,000 | E |
| Palm Avenue to SR-905 | 160,000 | 103,000 | C | 103,000 | C |
| *SR-905* | | | | | |
| I-805 to Heritage Road | 120,000 | 100,000 | B | 101,820 | B |

SOURCE: Caltrans; BRW, Inc.; May 1995.

## 5.4 SUMMARY OF FINDINGS

Considering the previous analyses, the following conclusions can be made:

- The addition of the amphitheater site will not result in significant adverse impacts to traffic operations under Opening Day 1996, Interim Year 2010 or Buildout (post-2015) conditions. Significant adverse impacts will not result primarily because of the following conditions:
  - The peak hour of the amphitheater is between 7:00 p.m. and 8:00 p.m. with most events occurring on weekends. This corresponds to periods when traffic volumes on the adjacent street system are low.
  - The peak hour of the open-air market is prior to 4:00 p.m. This is before the peak hour of the adjacent street system. The highest activity levels will be on weekends when roadway capacity is available.

- Significant capacity is being added to the adjacent street system to accommodate traffic in the immediate future. This includes the current widening of Otay Valley Road as a six-lane arterial to Nirvana Avenue and the construction of three westbound and two eastbound lanes to the project site.

- In the Interim Year 2010 Roadway Segment analysis, ADT volumes show that Heritage Road south of the site would be at or over capacity both with and without the site. Although the volumes exceed the LOS C threshold, the critical controlling consideration is the intersection with Otay Mesa Road. The intersection operates acceptably at LOS D.

- Although traffic volumes will grow over the next few years to Year 2010, sufficient capacity will exist to handle site volumes. This is because development of projects in the area such as Otay Ranch, the Corporate Yard and Otay Mesa will need to add the capacity to meet their generated travel demands.

• Traffic control plans will be critical to ensuring adequate operations. Control plans will be needed at the I-805 interchange, along Otay Valley Road and on the amphitheater site. A key component of these traffic control plans is the continuous refinement of the operations as experience is gained at various event sizes.

• Under full Southbay Buildout conditions, expected to occur after Year 2015, the street network will have reached maturity such that the site will be accessible from all four directions. Accordingly, trip distribution will be substantially dispersed and adverse impacts to traffic operations are not expected.

# 6.0 Mitigation and Monitoring Program

This Chapter presents the necessary mitigation to maintain acceptable levels of service during amphitheater events. This mitigation is primarily in the form of traffic control and includes minor geometric recommendations to planned intersection improvements. A discussion of the associated monitoring program which is intended to refine the traffic control management and mitigation program as it evolves is also provided. Off-site improvements required to accommodate the impacts of the project are subdivided into short-term and long-term improvements.

## 6.1 SHORT-TERM MITIGATION

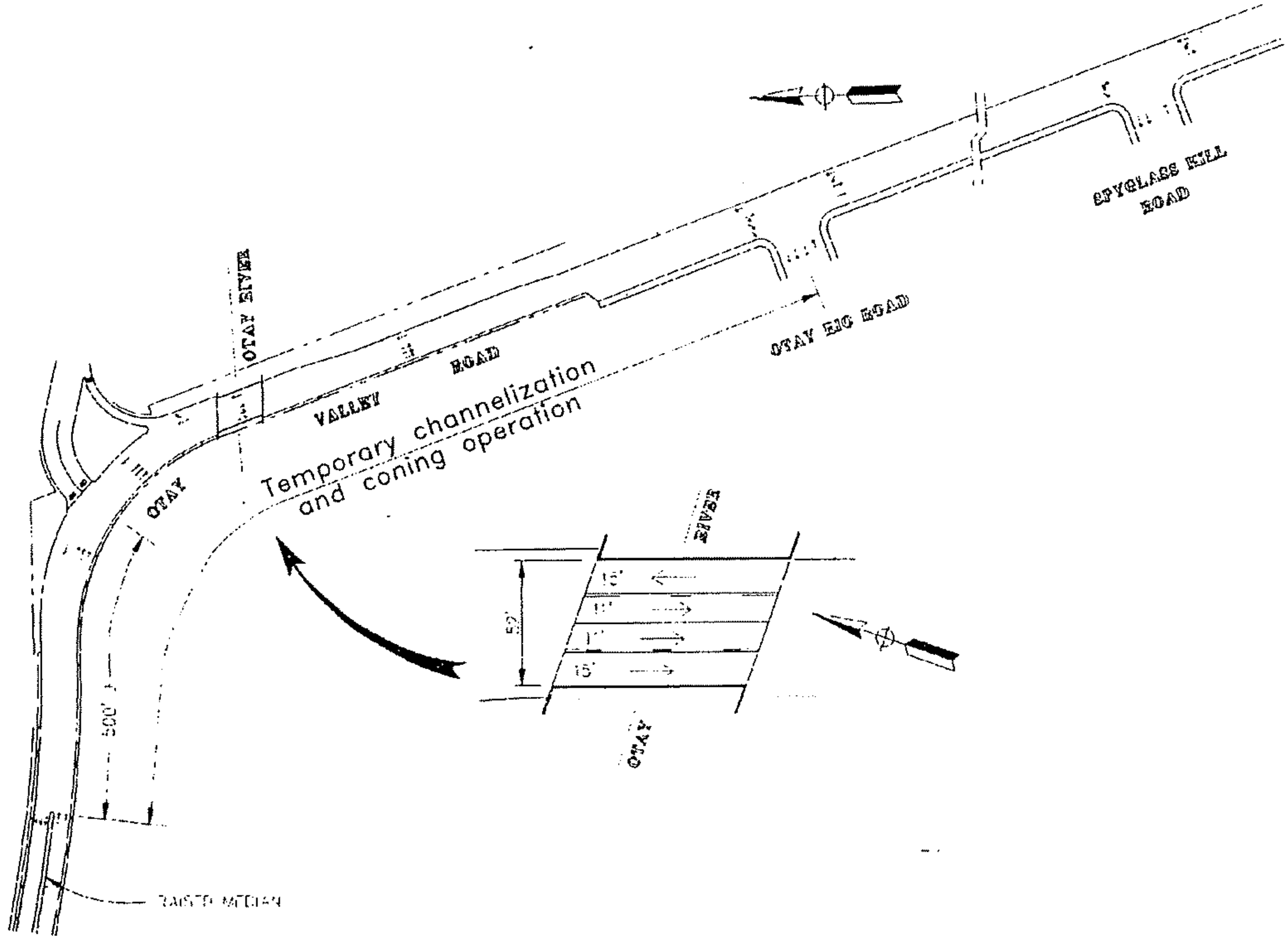
The following are recommendations of short-term mitigation measures designed to accommodate the anticipated traffic impacts associated with the project.

1. Complete the widening of Otay Valley Road from I-805 to Nirvana Avenue to provide the ultimate six-lane cross-section and median.

2. Modify the planned widening of Otay Valley Road from Nirvana to Otay Rio Road to provide the following:

   a. From Nirvana to northwest of the Otay River crossing, modify the planned improvements to provide three westbound lanes and two eastbound lanes.

   b. Between Otay Rio Road and northwest of the Otay River crossing, provide pavement and channelization on Otay Valley Road to permit the channelization/coning of traffic during events. This includes the provision of three eastbound lanes (inbound) for arriving traffic while maintaining one westbound lane. For departing traffic, provide three westbound lanes and one eastbound lane on Otay Valley Road. This would be accomplished through use of traffic control on Otay Valley Road as shown in Figures 15 and 16.

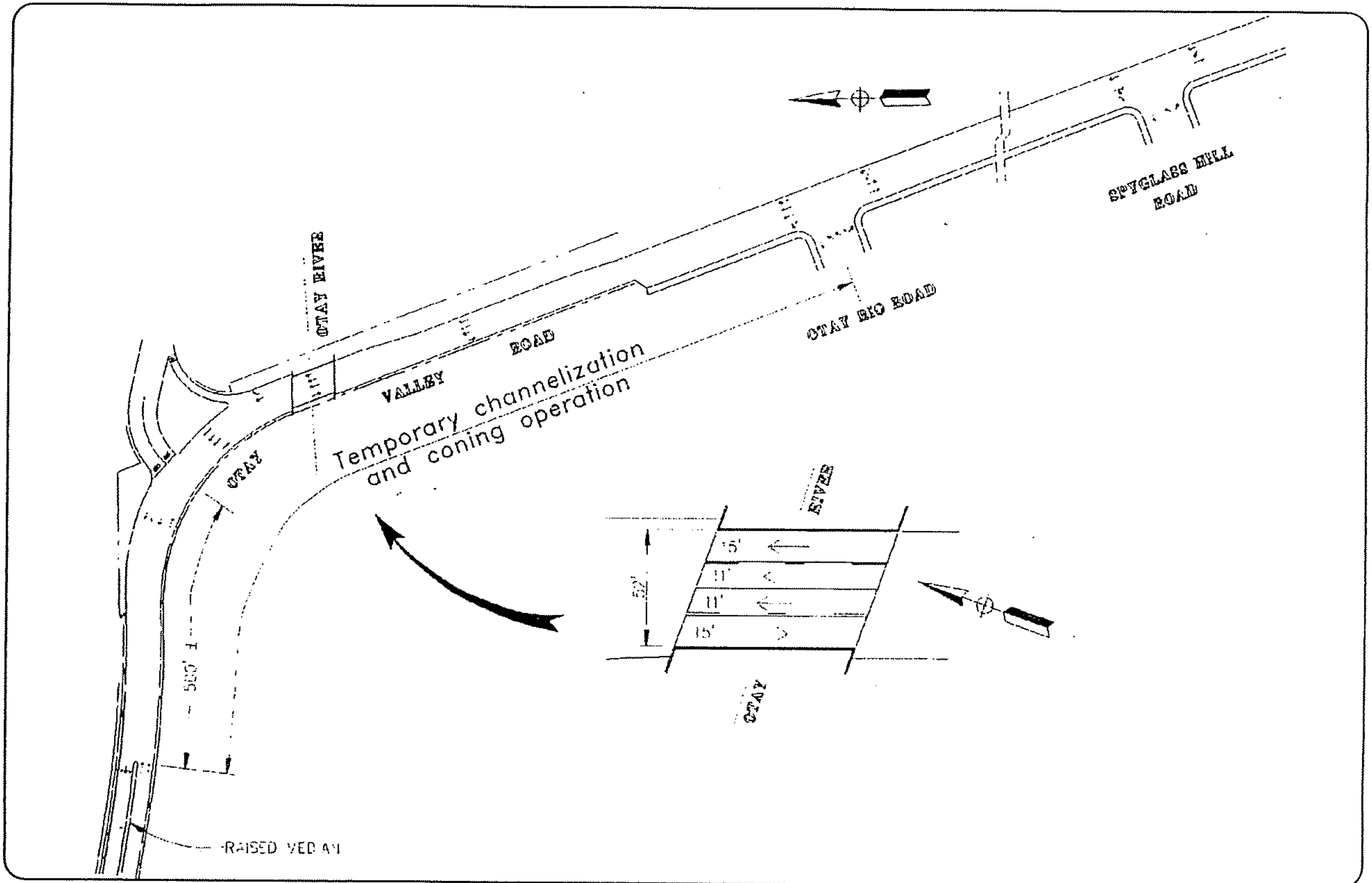



MCA AMPHITHEATER
Traffic Impact Analysis
Chula Vista, California

BRW 620 C Street, Suite 300
San Diego, California

Figure 15
## Channelization Concept for Amphitheater Arrivals

Source: Darnell & Associates, June 2, 1995




MCA AMPHITHEATER
Traffic Impact Analysis
Chula Vista, California

BRW 620 C Street, Suite 300
San Diego, California

Figure 16
**Channelization Concept for Amphitheater Departures**

Source: Darnell & Associates, June 2, 1995

c. Ensure through adequate control, monitoring and enforcement that event patrons park on-site and not on surrounding streets including Otay Valley Road.

3. Modify the planned southbound I-805 off-ramp channelization at the Otay Valley Road interchange to provide exclusive left, left/through/right, and exclusive right turn lanes.

4. Provide a traffic signal at the intersection of Otay Valley Road/Otay Rio Road which would also be used by the Open-Air Market at the primary entry-point.

5. Develop a management and mitigation monitoring program for approval by the City of Chula Vista that includes but is not limited to the following:

   a. Management Team consisting of MCA Amphitheater management, City of Chula Vista, Caltrans, CHP and law enforcement personnel for oversight and continued surveillance of the facility and associated events.

   b. Prepare plans for directional signing to and from the amphitheater during events. These plans will need to be closely coordinated with the City of Chula Vista and Caltrans. Event or temporary signing would be expected on I-805, Otay Valley Road and Otay Mesa Road.

   c. Prepare traffic control strategies and equipment requirements for the intersections along Otay Valley Road and at Otay Valley Road/Heritage Road. These strategies will need to address manpower and equipment requirements and determine the hours of operation.

   Due to the heavy peak demands at the I-805/Otay Valley Road interchange, it is recommended that traffic control personnel be assigned to assist in directing of traffic at the interchange as well as at signalized intersections along Otay Valley Road. Traffic control personnel and barricades should also be employed at Oleander Avenue and/or other local roadways to direct traffic and eliminate short-cut traffic through residential areas.

d. Develop an on-site access plan to minimize conflicts with pedestrian traffic and vehicles, adequately place pay points, and determine procedures to fill the parking areas from Otay Valley Road via Otay Rio Road and Spy Glass Hill Road. This dual ingress scheme may need to load both roads with inbound traffic simultaneously. The plan will need to include:

- Channelization/coning plans and traffic control personnel requirements;
- Location and number of pay points;
- Pedestrian control on-site and to limit pedestrians along Otay Valley Road;
- Tow truck and emergency equipment requirements for stalled and disabled vehicles; and,
- A plan to maintain access to and from the City of Chula Vista Corporation Yard during events. Due to the heavy traffic demand during arrival and departure periods, it may be necessary for amphitheater management personnel to make provisions for off-site facilities such as a separate driveway to Otay Valley Road to accommodate emergency activities of the City.

## 6.2 RECOMMENDED EVENT MONITORING PROGRAM (EMP)

It is recommended that an event monitoring program (EMP) be developed as an additional mitigation measure for the proposed project. The goals of the EMP are as follows:

- To ensure that area residents are allowed to travel to and from their homes to a destination outside the area with minimal delay;
- To provide access for emergency vehicles to the area;
- To provide monitoring of traffic flow and parking on streets in residential areas during selected events;
- To develop appropriate signage and advertising directing traffic to designated parking areas based on the nature of the event and anticipated attendance; and
- To demonstrate sensitivity to the timing of events, taking into account parking and traffic flows related to peak traffic periods, residential commuter patterns and anticipated attendance.

The procedures of the EMP intend to facilitate the flow of traffic to and from designated parking areas and address other issues of concern resulting from scheduled events. The EMP process will enable the applicant to develop traffic management plans which are tiered to various levels of anticipated event attendance.

To implement this EMP it is recommended that the City require the applicant to retain an independent traffic engineering firm to monitor traffic congestion levels and recommend further appropriate mitigation measures. This monitoring element would require documentation of traffic impacts as a result of events on a periodic basis. This periodic monitoring would be conducted by the independent traffic engineering firm, which would be responsible for analyzing event traffic conditions and associated impacts at various levels of attendance at selected events over the course of a year. In addition to analyzing event-related impacts, the firm would also be required to analyze traffic conditions and intersection levels of service on non-event days or evenings to establish an up-to-date database for assessing the effectiveness of the traffic management plan. All field data collection and technical analysis would be summarized into an annual report for public review and review by the Events Management Advisory Committee to be established by the City.

One of the key purposes of this monitoring program is to ensure that the levels of service at critical study area intersections are not adversely impacted by event traffic. By comparing levels of service from non-event period with levels of service during event periods, the monitoring reports will document the effectiveness of the overall EMP. It is presumed that future modifications to the traffic monitoring program could be developed as a result of the periodic traffic analysis (Monitoring Program) conducted and documented in the monitoring reports. These traffic management modifications would attempt to optimize the flow of traffic generated by scheduled events. The efficient management of event generated traffic will benefit local residents, commercial and industrial business owners and event attendees.

## 6.3 LONG-TERM MITIGATION

The short-term mitigation measures will be sufficient to accommodate the immediate opening of the project, as well as mitigate project-related impacts under Interim Year 2010, Year 2015 and Buildout conditions. This conclusion is based on the limited amount of additional traffic growth expected to and from the immediate area. The interim Year 2010 and Buildout traffic demands for the area are based on future development with the Otay Ranch project, Otay Mesa area and City of San Diego. The project will contribute to future daily traffic volumes on days with scheduled events. However, the additional traffic volumes will occur primarily during off-peak evening times when traffic demands are significantly less than during the traditional morning and late afternoon/early evening peak periods.

The I-805/Otay Valley Road interchange on- and off-ramps have been identified as in need of improvements to accommodate the widening of Otay Valley Road to six-lanes and provide necessary turning lanes. The ultimate improvements will be determined in the future as Caltrans completes the Project Study Report for the I-805 corridor. The improvements will be necessary to accommodate the ultimate traffic needs for the area. Therefore, this amphitheater project should be conditioned to provide a "fair share" contribution to the future improvements of this interchange.

# Appendix A

## Peak Hour Intersection Capacity Worksheets

- Existing Conditions

```
Condition: EXISTING CONDITIONS                                     05/10/95
===========================================================================
INTERSECTION     1 I-805 SB RAMPS/MAIN STREET           CITY OF CHULA VISTA
Count Date 4-6-95            Time 4:15-5:15 PM   Peak Hour PM
---------------------------------------------------------------------------
85 HCM Operations                                      ACTUATED,NON-CBD
                 267    0  242                             60-SEC CYCLE
                    |    |    |                        PHASE    GRN Y+R LOST
           ^        |    |    |           ^            -------- --- --- ----
           |      <---   v   --->         |            1 S-LTR   15   4  3.0
    0 ---  0.0    2.0  1.1  1.1    0.0 ---     0       2 W-LT    15   4  3.0
                                                       3 E-TR    18   4  3.0
  466 ---> 3.0   (NO. OF LANES)    2.0<---   358         W-T

  318 ---  1.0    0.0  0.0  0.0    1.0 ---   246
           |      <---   ^   --->         |
           v        |    |    |           v
  N                 |    |    |
W + E               0    0    0
  S
===========================================================================
   RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH   TYP     FACTOR        FLOW
---------------------------------------------------------------------------
              12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10   3
SB      0   10   3       5   N   0.0  0   2  2  2  3   0.90 0.90 0.90  1900
EB      0    0          15   N   0.0  0   2  2  2  3   0.90 0.90 0.90  1900
WB      0    0          15   N   0.0  0   2  2  2  3   0.90 0.90 0.90  1900
===========================================================================
      LANE              ADJ        PHASE                        LANE   L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                        GROUP  O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S  12345678  G/C CAPAC   V/C     DELAY  S|& LOS
------------------------------------------------------------------------+-----
SB L   12.0  242                  1                                     | 12.5
   T   12.0    0                  1                                     |    B
   R   12.0  267   312 2822 0.110 1        0.267  753  0.414    11.9 B|
   LT  12.0  242   269 1791 0.150 1        0.267  478  0.563*   13.2 B|
------------------------------------------------------------------------+-----
EB T   12.0  466   570 5643 0.101    3     0.317 1787  0.319    10.1 B| 11.8
   R   12.0  318   353 1590 0.222    3     0.317  504  0.702*   14.2 B|    B
------------------------------------------------------------------------+-----
WB L   12.0  246   273 1787 0.153   2      0.267  477  0.574*   15.7 C|  8.1
   T   12.0  358   418 3762 0.111   23     0.633 2383  0.175     2.9 A|    B
===========================================================================
*=CRITICAL LANE GROUP             DELAY= 10.8 SEC/VEH   V/C =0.58   LOS=B
===========================================================================
INT=EXIS-PM.INT,VOL=EXIS.PMV,CAP=...LOSCAP.TAB
```

```
Condition: EXISTING CONDITIONS                                      05/10/95
============================================================================
INTERSECTION     2 I-805 NB RAMPS/OTAY VALLEY ROAD    CITY OF CHULA VISTA
Count Date 4-6-95              Time 4:15-5:15 PM   Peak Hour PM
----------------------------------------------------------------------------
85 HCM Operations                                      ACTUATED,NON-CBD
                       0    0    0                         60-SEC CYCLE
                       |    |    |                     PHASE     GRN Y+R LOST
        ^              |    |    |             ^       -------- --- --- ----
        |           <---    v    --->          |       1 N-LTR   10   4  3.0
  372 ---   1.0    0.0  0.0  0.0     1.0 ---    403    2 E-LT    17   4  3.0
                                                       3 E-T     21   4  3.0
  337 ---> 2.0   (NO. OF LANES)      3.0<---    454      W-TR

    0 ---   0.0    1.1  1.1  2.0     0.0 ---      0
        |           <---    ^    --->          |
        v              |    |    |             v
  N                    |    |    |
W + E                 221   0   176
  S
```

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 3 | 5 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 0 | 10 | 3 | | | | | | | | | | | | |
| EB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB L | 12.0 | 221 | | | | 1 | | | | | | 17.6 |
| T | 12.0 | 0 | | | | 1 | | | | | | C |
| R | 12.0 | 176 | 205 | 2822 | 0.073 | 1 | 0.183 | 517 | 0.397 | 14.2 | B | |
| LT | 12.0 | 221 | 246 | 1791 | 0.137 | 1 | 0.183 | 328 | 0.748* | 20.3 | C | |
| EB L | 12.0 | 372 | 413 | 1787 | 0.231 | 2 | 0.300 | 536 | 0.771* | 19.2 | C | 10.9 |
| T | 12.0 | 337 | 393 | 3762 | 0.105 | 23 | 0.717 | 2696 | 0.146 | 1.7 | A | B |
| WB T | 12.0 | 454 | 555 | 5643 | 0.098 | 3 | 0.367 | 2069 | 0.268 | 8.6 | B | 11.4 |
| R | 12.0 | 403 | 448 | 1590 | 0.282 | 3 | 0.367 | 583 | 0.768* | 14.4 | B | B |

```
*=CRITICAL LANE GROUP              DELAY= 12.5 SEC/VEH    V/C =0.72    LOS=B
============================================================================
INT=EXIS-PM.INT,VOL=EXIS.PMV,CAP=...LOSCAP.TAB
```

```
Condition: EXISTING CONDITIONS                                      05/10/95
============================================================================
INTERSECTION     3 OLEANDER AVENUE/OTAY VALLEY ROAD  CITY OF CHULA VISTA
Count Date FEB 1995          Time                 Peak Hour PM
----------------------------------------------------------------------------
85 HCM Operations                                  ACTUATED,NON-CBD
                        70    5   15                   60-SEC CYCLE
                         |    |    |               PHASE     GRN Y+R LOST
           -             |    |    |         -     -------- --- --- ----
           |          <---    v    --->      |     1 NS-LTR  22   4  3.0
   55 ---   1.0    1.1  1.1  1.0   1.1 ---    15   2 EW-L     5   4  3.0
                                                   3 EW-TR   21   4  3.0
  365 ---> 3.1   (NO. OF LANES)    3.1<---   695

    5 ---   1.1    1.1  1.1  1.1   1.0 ---     5
           |      <---    -    --->      |
           v             |    |    |     v
  N                      |    |    |
W + E                    5    5    5
  S
============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR    PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP      FACTOR      FLOW
----------------------------------------------------------------------------
              12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10   3      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
SB      0   10   3      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
EB      0   10 1        22   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB      0   10 1        22   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
============================================================================
      LANE             ADJ         PHASE                           LANE  L|APRCH
LANE  WIDTH       ADJ  SAT         ORDER                           GROUP O|DELAY
GROUP (FT.)  VOL  VOL FLOW  V/S   12345678  G/C CAPAC   V/C        DELAY S|& LOS
----------------------------------------------------------------------------+-----
NB L   12.0    5                  1                                        |  7.4
   T   12.0    5                  1                                        |    B
   R   12.0    5                  1                                        |
   LTR 12.0   15   17 1590 0.010  1        0.383  609   0.027      7.4 B|
----------------------------------------------------------------------------+-----
SB L   12.0   15   17 1748 0.010  1        0.383  670   0.025      8.8 B|  7.9
   T   12.0    5                  1                                        |    B
   R   12.0   70                  1                                        |
   TR  12.0   75   83 1609 0.052  1        0.383  617   0.135*     7.8 B|
----------------------------------------------------------------------------+-----
EB L   12.0   55   61 1787 0.034   2       0.100  179   0.342*  19.6 C|  9.9
   T   12.0  365                    3                                      |    B
   R   12.0    5                    3                                      |
   TR  12.0  370  452 5631 0.080    3      0.367 2065   0.219      8.5 B|
----------------------------------------------------------------------------+-----
WB L   12.0    5    6 1787 0.003   2       0.100  179   0.031   18.5 C|  9.3
   T   12.0  695                    3                                      |    B
   R   12.0   15                    3                                      |
   TR  12.0  710  868 5625 0.154    3      0.367 2063   0.421*     9.3 B|
==================================================================================
*=CRITICAL LANE GROUP            DELAY=  9.4 SEC/VEH   V/C =0.28    LOS=B
==================================================================================
INT=EXIS-PM.INT,VOL=EXIS.PMV,CAP=...LOSCAP.TAB
```

Condition: EXISTING CONDITIONS 05/10/95

INTERSECTION 4 BRANDYWINE AVE/OTAY VALLEY ROAD CITY OF CHULA VISTA
Count Date FEB 1995 Time Peak Hour PM

85 HCM Operations

```
                         130     5    10
                          |      |     |
           ^              |      |     |            ^
           |            <---     v    --->          |
  130 ---     1.0      1.1   1.1   1.0     1.1 ---       35

  245 ---> 3.1     (NO. OF LANES)     3.1<---       575

    5 ---     1.1      1.0   1.1   1.1     1.0 ---        5
           |            <---     ^    --->          |
           v              |      |     |            v
   N                      |      |     |
 W + E                    5      5     5
   S
```

ACTUATED,NON-CBD
60-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 NS-LTR | 22 | 4 | 3.0 |
| 2 EW-L | 7 | 4 | 3.0 |
| 3 EW-TR | 19 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 3 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 0 | 10 | 3 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 10 | 1 | 22 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 0 | 10 | 1 | 22 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | L O S | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | L | 12.0 | 5 | 6 | 1442 | 0.004 | 1 | 0.383 | 553 | 0.010 | 8.7 | B | 7.8 |
| | T | 12.0 | 5 | | | | 1 | | | | | | B |
| | R | 12.0 | 5 | | | | 1 | | | | | | |
| | TR | 12.0 | 10 | 11 | 1735 | 0.006 | 1 | 0.383 | 665 | 0.017 | 7.4 | B | |
| SB | L | 12.0 | 10 | 11 | 1764 | 0.006 | 1 | 0.383 | 676 | 0.016 | 8.7 | B | 8.2 |
| | T | 12.0 | 5 | | | | 1 | | | | | | B |
| | R | 12.0 | 130 | | | | 1 | | | | | | |
| | TR | 12.0 | 135 | 150 | 1601 | 0.094 | 1 | 0.383 | 614 | 0.244* | 8.2 | B | |
| EB | L | 12.0 | 130 | 144 | 1787 | 0.081 | 2 | 0.133 | 238 | 0.606* | 21.7 | C | 13.4 |
| | T | 12.0 | 245 | | | | 3 | | | | | | B |
| | R | 12.0 | 5 | | | | 3 | | | | | | |
| | TR | 12.0 | 250 | 306 | 5626 | 0.054 | 3 | 0.333 | 1875 | 0.163 | 9.1 | B | |
| WB | L | 12.0 | 5 | 6 | 1787 | 0.003 | 2 | 0.133 | 238 | 0.023 | 17.2 | C | 10.1 |
| | T | 12.0 | 575 | | | | 3 | | | | | | B |
| | R | 12.0 | 35 | | | | 3 | | | | | | |
| | TR | 12.0 | 610 | 746 | 5593 | 0.133 | 3 | 0.333 | 1864 | 0.400* | 10.0 | B | |

*=CRITICAL LANE GROUP DELAY= 10.9 SEC/VEH V/C =0.36 LOS=B

INT=EXIS-PM.INT,VOL=EXIS.PMV,CAP=...LOSCAP.TAB

Condition: EXISTING CONDITIONS 05/10/95

INTERSECTION 5 HERITAGE ROAD/OTAY MESA ROAD CITY OF SAN DIEGO
Count Date FEB 1995 Time Peak Hour PM

85 HCM Operations

```
                     595    40   110
                       |     |    |                        
        ^              |     |    |          ^             
        |           <---     v    --->       |             
  255 ---   1.0     1.1   1.1   1.0     1.0 ---     35     
                                                           
 1330 ---> 2.1    (NO. OF LANES)      2.0<--- 1610         
                                                           
   60 ---   1.1     1.0   1.1   1.1     1.0 ---     20     
        |           <---     ^    --->       |             
        v              |     |    |          v             
  N                    |     |    |                        
W + E                 225    25   75                       
  S
```

ACTUATED,NON-CBD
120-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 NS-L | 11 | 4 | 3.0 |
| 2 NS-TR | 32 | 4 | 3.0 |
| 3 EW-L | 12 | 4 | 3.0 |
| 4 EW-TR | 49 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRKING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 15 | 10 | 4 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 50 | 10 | 4 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 0 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | L | 12.0 | 225 | 250 | 1787 | 0.140 | 1 | 0.100 | 179 | 1.399* | 358.6 | F | 254.9 |
| | T | 12.0 | 25 | | | | 2 | | | | | | F |
| | R | 12.0 | 75 | | | | 2 | | | | | | |
| | TR | 12.0 | 100 | 94 | 1676 | 0.056 | 2 | 0.275 | 461 | 0.205 | 21.6 | C | |
| SB | L | 12.0 | 110 | 122 | 1787 | 0.068 | 1 | 0.100 | 179 | 0.684 | 46.6 | E | 303.4 |
| | T | 12.0 | 40 | | | | 2 | | | | | | F |
| | R | 12.0 | 595 | | | | 2 | | | | | | |
| | TR | 12.0 | 635 | 650 | 1610 | 0.404 | 2 | 0.275 | 443 | 1.468* | 347.9 | F | |
| EB | L | 12.0 | 255 | 283 | 1787 | 0.159 | 3 | 0.108 | 194 | 1.464* | 429.6 | F | 106.9 |
| | T | 12.0 | 1330 | | | | 4 | | | | | | F |
| | R | 12.0 | 60 | | | | 4 | | | | | | |
| | TR | 12.0 | 1390 | 1622 | 3737 | 0.434 | 4 | 0.417 | 1557 | 1.041 | 47.7 | E | |
| WB | L | 12.0 | 20 | 22 | 1787 | 0.012 | 3 | 0.108 | 194 | 0.115 | 36.7 | D | 113.0 |
| | T | 12.0 | 1610 | 1878 | 3762 | 0.499 | 4 | 0.417 | 1567 | 1.198* | 116.2 | F | F |
| | R | 12.0 | 35 | 39 | 1590 | 0.024 | 4 | 0.417 | 662 | 0.059 | 13.5 | B | |

*=CRITICAL LANE GROUP DELAY=153.6 SEC/VEH V/C =1.33 LOS=F

INT=EXIS-PM.INT,VOL=EXIS.PMV,CAP=...LOSCAP.TAB

# Appendix B

## Peak Hour Intersection Capacity Worksheets

- Opening Day 1996 Background Conditions

```
Condition: OPENING DAY 1996 BACKGROUND CONDITIONS                05/10/95
=========================================================================
INTERSECTION      1 I-805 SB RAMPS/MAIN STREET          CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
-------------------------------------------------------------------------
85 HCM Operations                                     ACTUATED,NON-CBD
                        63    0   71                      60-SEC CYCLE
                         |    |    |                  PHASE    GRN Y+R LOST
               ^         |    |    |        ^         -------- --- --- ----
               |       <---   v   --->      |         1 S-LTR   10   4  3.0
    0 ---    0.0     2.0  1.1  1.1    0.0 ---    0    2 W-LT    12   4  3.0
                                                      3 E-TR    26   4  3.0
  195 ---> 3.0    (NO. OF LANES)      2.0<---   225     W-T

  156 ---    1.0     0.0  0.0  0.0    1.0 ---   126
               |       <---   ^   --->      |
               v         |    |    |        v
  N                      |    |    |
W + E                    0    0    0
  S
=========================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR    PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR       FLOW
-------------------------------------------------------------------------
               12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10   3
SB      0   10   3       5   N  0.0  0    2  2  2  3   1.00 1.00 1.00  1900
EB      0    0          15   N  0.0  0    2  2  2  3   1.00 1.00 1.00  1900
WB      0    0          15   N  0.0  0    2  2  2  3   1.00 1.00 1.00  1900
=========================================================================
      LANE              ADJ        PHASE                        LANE  L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                        GROUP O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S   12345678  G/C CAPAC  V/C     DELAY S|& LOS
-------------------------------------------------------------------------+-----
SB L   12.0   71                   1                                     | 13.4
   T   12.0    0                   1                                     |    B
   R   12.0   63    66 2822 0.023 1         0.183  517  0.128   13.2 B |
   LT  12.0   71    71 1791 0.040 1         0.183  328  0.216*  13.5 B |
-------------------------------------------------------------------------+-----
EB T   12.0  195   215 5643 0.038   3       0.450 2539  0.084    6.1 B |  6.3
   R   12.0  156   156 1590 0.098   3       0.450  715  0.218*   6.5 B |    B
-------------------------------------------------------------------------+-----
WB L   12.0  126   126 1787 0.071  2        0.217  387  0.325*  15.2 C |  6.5
   T   12.0  225   236 3762 0.063  23       0.717 2696  0.088    1.7 A |    B
=========================================================================
*=CRITICAL LANE GROUP           DELAY=  7.5 SEC/VEH   V/C =0.23    LOS=B
=========================================================================
INT=96BCKGND.INT,VOL=96BCKGND.PMV,CAP=...LOSCAP.TAB
```

Condition: OPENING DAY 1996 BACKGROUND CONDITIONS 05/10/95

INTERSECTION 2 I-805 NB RAMPS/OTAY VALLEY ROAD CITY OF CHULA VISTA
Count Date OPENING DAY 1996 Time 7-8 BACKGRND Peak Hour AMPHITHEATRE

85 HCM Operations

```
                           0      0      0
                           |      |      |
         ^                 |      |      |          ^
         |              <---      v      --->       |
  186 ---     1.0     0.0    0.0    0.0     1.0 ---      162
   97 --->    2.0     (NO. OF LANES)        3.0<---      105
    0 ---     0.0     1.1    1.1    2.0     0.0 ---        0
         |            <---    ^     --->        |
         v                 |      |      |      v
   N                       |      |      |
 W + E                   211      0    111
   S
```

ACTUATED, NON-CBD
60-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 N-LTR | 13 | 4 | 3.0 |
| 2 E-LT | 16 | 4 | 3.0 |
| 3 E-T<br>W-TR | 19 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | %HVY VEH TH | %HVY VEH RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 3 | 5 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 0 | 10 | 3 | | | | | | | | | | | | |
| EB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB L | 12.0 | 211 | | | | 1 | | | | | | 13.4 |
| T | 12.0 | 0 | | | | 1 | | | | | | B |
| R | 12.0 | 111 | 130 | 2822 | 0.046 | 1 | 0.233 | 658 | 0.197 | 12.0 | B | |
| LT | 12.0 | 211 | 234 | 1791 | 0.131 | 1 | 0.233 | 418 | 0.561* | 14.2 | B | |
| EB L | 12.0 | 186 | 207 | 1787 | 0.116 | 2 | 0.283 | 506 | 0.408* | 13.6 | B | 9.7 |
| T | 12.0 | 97 | 113 | 3762 | 0.030 | 23 | 0.667 | 2508 | 0.045 | 2.2 | A | B |
| WB T | 12.0 | 105 | 128 | 5643 | 0.023 | 3 | 0.333 | 1881 | 0.068 | 8.8 | B | 9.4 |
| R | 12.0 | 162 | 180 | 1590 | 0.113 | 3 | 0.333 | 530 | 0.340* | 9.8 | B | B |

*=CRITICAL LANE GROUP DELAY= 11.0 SEC/VEH V/C =0.40 LOS=B

INT=96BCKGND.INT,VOL=96BCKGND.PMV,CAP=...LOSCAP.TAB

```
Condition: OPENING DAY 1996 BACKGROUND CONDITIONS                    05/10/95
===============================================================================
INTERSECTION     3 OLEANDER AVENUE/OTAY VALLEY ROAD  CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
-------------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                  45    5   10                           60-SEC CYCLE
                   |    |    |                       PHASE    GRN Y+R LOST
        ^          |    |    |             ^         -------- --- --- ----
        |       <---    v    --->          |         1 NS-LTR  22   4  3.0
   36 ---   1.0   1.1  1.1  1.0    1.1 ---    10     2 EW-L     5   4  3.0
                                                     3 EW-TR   21   4  3.0
  184 ---> 3.1  (NO. OF LANES)   3.1<---   180

    5 ---   1.1   1.1  1.1  1.1    1.0 ---     5
        |       <---    ^    --->          |
        v          |    |    |             v
  N                |    |    |
W + E              5    5    5
  S
===============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR        FLOW
-------------------------------------------------------------------------------
              12345678                    LT TH RT      LEFT THRU RGHT
NB      0   10    3     15   N  0.0  0    2  2  2   3  0.90 0.90 0.90  1900
SB      0   10    3     15   N  0.0  0    2  2  2   3  0.90 0.90 0.90  1900
EB      0   10 1        22   N  0.0  0    2  2  2   3  0.90 0.90 0.90  1900
WB      0   10 1        22   N  0.0  0    2  2  2   3  0.90 0.90 0.90  1900
===============================================================================
      LANE                ADJ       PHASE                       LANE  L|APRCH
LANE  WIDTH          ADJ  SAT       ORDER                       GROUP O|DELAY
GROUP (FT.)   VOL   VOL FLOW   V/S  12345678  G/C CAPAC  V/C    DELAY S|& LOS
--------------------------------------------------------------------------+-----
NB L    12.0    5                   1                                     |  7.4
   T    12.0    5                   1                                     |    B
   R    12.0    5                   1                                     |
   LTR  12.0   15    17 1605 0.010  1         0.383  615  0.027    7.4 B|
--------------------------------------------------------------------------+-----
SB L    12.0   10    11 1748 0.006  1         0.383  670  0.017    8.7 B|  7.8
   T    12.0    5                   1                                     |    B
   R    12.0   45                   1                                     |
   TR   12.0   50    56 1619 0.034  1         0.383  621  0.090*   7.6 B|
--------------------------------------------------------------------------+-----
EB L    12.0   36    40 1787 0.022   2        0.100  179  0.224*  19.0 C|  9.9
   T    12.0  184                     3                                   |    B
   R    12.0    5                     3                                   |
   TR   12.0  189   231 5620 0.041    3       0.367 2061  0.112    8.1 B|
--------------------------------------------------------------------------+-----
WB L    12.0    5     6 1787 0.003   2        0.100  179  0.031   18.5 C|  8.4
   T    12.0  180                     3                                   |    B
   R    12.0   10                     3                                   |
   TR   12.0  190   232 5597 0.041    3       0.367 2052  0.113*   8.1 B|
================================================================================
*=CRITICAL LANE GROUP            DELAY=  9.0 SEC/VEH   V/C =0.12    LOS=B
================================================================================
INT=96BCKGND.INT,VOL=96BCKGND.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 BACKGROUND CONDITIONS                 05/10/95
===========================================================================
INTERSECTION      4 BRANDYWINE AVE/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                        41    10     5                   60-SEC CYCLE
                         |     |     |                PHASE     GRN Y+R LOST
          ^              |     |     |          ^     -------- --- --- ----
          |           <---     v     --->       |     1 NS-LTR  22   4  3.0
   51 ---    1.0    1.1   1.1   1.0    1.1 ---     10 2 EW-L     7   4  3.0
                                                      3 EW-TR   19   4  3.0
  133 ---> 3.1   (NO. OF LANES)   3.1<---    148

   15 ---    1.1    1.0   1.1   1.1    1.0 ---     10
          |         <---    ^    --->       |
          v                 |     |     |           v
  N                         |     |     |
W + E                      10     5    10
  S
============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR        SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR         FLOW
----------------------------------------------------------------------------
                 12345678                 LT  TH  RT      LEFT THRU RGHT
NB     0   10    3        15   N   0.0  0   2   2   2   3  0.90 0.90 0.90  1900
SB     0   10    3        15   N   0.0  0   2   2   2   3  0.90 0.90 0.90  1900
EB     0   10 1           22   N   0.0  0   2   2   2   3  0.90 0.90 0.90  1900
WB     0   10 1           22   N   0.0  0   2   2   2   3  0.90 0.90 0.90  1900
============================================================================
      LANE               ADJ        PHASE                         LANE   L|APRCH
LANE  WIDTH         ADJ  SAT        ORDER                         GROUP  O|DELAY
GROUP (FT.)   VOL   VOL FLOW  V/S  12345678  G/C CAPAC   V/C      DELAY  S|& LOS
----------------------------------------------------------------------+-----
NB L   12.0    10    11 1658 0.007 1        0.383  636  0.017      8.7 B|  8.0
   T   12.0     5                  1                                    |    B
   R   12.0    10                  1                                    |
   TR  12.0    15    17 1687 0.010 1        0.383  647  0.026      7.4 B|
----------------------------------------------------------------------+-----
SB L   12.0     5     6 1751 0.003 1        0.383  671  0.008      8.7 B|  7.7
   T   12.0    10                  1                                    |    B
   R   12.0    41                  1                                    |
   TR  12.0    51    57 1647 0.034 1        0.383  631  0.090*     7.6 B|
----------------------------------------------------------------------+-----
EB L   12.0    51    57 1787 0.032  2       0.133  238  0.238*    17.8 C| 11.2
   T   12.0   133                    3                                  |    B
   R   12.0    15                    3                                  |
   TR  12.0   148   181 5554 0.033   3      0.333 1851  0.098      8.9 B|
----------------------------------------------------------------------+-----
WB L   12.0    10    11 1787 0.006  2       0.133  238  0.047     17.2 C|  9.4
   T   12.0   148                    3                                  |    B
   R   12.0    10                    3                                  |
   TR  12.0   158   193 5588 0.035   3      0.333 1863  0.104*     8.9 B|
============================================================================
*=CRITICAL LANE GROUP          DELAY=  9.9 SEC/VEH   V/C =0.12    LOS=B
============================================================================
INT=96BCKGND.INT,VOL=96BCKGND.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 BACKGROUND CONDITIONS                    05/10/95
=========================================================================
INTERSECTION     5 HERITAGE ROAD/OTAY MESA ROAD      CITY OF SAN DIEGO
Count Date OPENING DAY 1996  Time 7-8 BAKCGRND   Peak Hour AMPHITHEATRE
-------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                 347   25   65                           80-SEC CYCLE
                   |    |    |                       PHASE    GRN Y+R LOST
       -           |    |    |           -           -------- --- --- ----
       |         <---   v    --->        |           1 NS-L     7   4  3.0
  138 ---   1.0   1.1  1.1  1.0    1.0 ---     20    2 NS-TR   22   4  3.0
                                                     3 EW-L     7   4  3.0
  780 ---> 2.1  (NO. OF LANES)    2.0<---    944    4 EW-TR   28   4  3.0

   36 ---   1.1   1.0  1.1  1.1    1.0 ---     10
       |         <---   -    --->        |
       v           |    |    |           v
  N                |    |    |
W + E             133   10   41
  S
==========================================================================
   RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH   TYP     FACTOR      FLOW
--------------------------------------------------------------------------
              12345678                 LT TH RT      LEFT THRU RGHT
NB    0   10     4     15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
SB   50   10     4     15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
EB    0   10  2        18   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB    0   10  2        18   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
==========================================================================
      LANE            ADJ        PHASE                       LANE  L|APRCH
LANE  WIDTH       ADJ  SAT       ORDER                       GROUP O|DELAY
GROUP (FT.)  VOL  VOL FLOW  V/S  12345678  G/C CAPAC  V/C    DELAY S|& LOS
------------------------------------------------------------------+-----
NB L  12.0  133  148 1787 0.083 1         0.100  179  0.827* 44.5 E| 35.9
   T  12.0   10                  2                                 |    D
   R  12.0   41                  2                                 |
   TR 12.0   51   57 1647 0.034  2        0.288  474  0.120  13.6 B|
------------------------------------------------------------------+-----
SB L  12.0   65   72 1787 0.040 1         0.100  179  0.404  26.5 D| 22.2
   T  12.0   25                  2                                 |    C
   R  12.0  347                  2                                 |
   TR 12.0  372  358 1612 0.222  2        0.288  463  0.772* 21.5 C|
------------------------------------------------------------------+-----
EB L  12.0  138  153 1787 0.086   3       0.100  179  0.858* 48.5 E| 19.9
   T  12.0  780                    4                               |    C
   R  12.0   36                    4                               |
   TR 12.0  816  952 3736 0.255    4      0.363 1354  0.703  15.1 C|
------------------------------------------------------------------+-----
WB L  12.0   10   11 1787 0.006   3       0.100  179  0.062  24.8 C| 17.0
   T  12.0  944 1101 3762 0.293    4      0.363 1364  0.808* 17.1 C|    C
   R  12.0   20   22 1590 0.014    4      0.363  576  0.039  10.7 B|
==========================================================================
*=CRITICAL LANE GROUP          DELAY= 20.4 SEC/VEH   V/C =0.80   LOS=C
==========================================================================
INT=96BCKGND.INT,VOL=96BCKGND.PMV,CAP=...LOSCAP.TAB
```

# Appendix C

## Peak Hour Intersection Capacity Worksheets

- Opening Day 1996 With Project Conditions

```
Condition: OPENING DAY 1996 WITH PROJECT CONDITIONS                05/10/95
===========================================================================
INTERSECTION      1 I-805 SB RAMPS/MAIN STREET        CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                        63    0 1571                     60-SEC CYCLE
                         |    |   |                  PHASE    GRN Y+R LOST
        ^                |    |   |        ^         -------- --- --- ----
        |              <---   v   --->     |         1 S-LTR   10   4  3.0
    0 ---   0.0   2.0   1.1  1.1   0.0 ---     0     2 W-LT    12   4  3.0
                                                     3 E-TR    26   4  3.0
  860 ---> 3.0  (NO. OF LANES)     2.0<---   225       W-T

  156 ---   1.0   0.0   0.0  0.0   1.0 ---   126
        |       <---    ^   --->       |
        v          |    |    |         v
  N                |    |    |
W + E              0    0    0
  S
===========================================================================
   RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH    TYP    FACTOR        FLOW
---------------------------------------------------------------------------
               12345678                 LT TH RT      LEFT THRU RGHT
NB     0   10   3
SB     0   10   3        5   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
EB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
===========================================================================
      LANE              ADJ        PHASE                       LANE  L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                       GROUP O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S  12345678  G/C CAPAC   V/C    DELAY S|& LOS
-----------------------------------------------------------------------+-----
SB L   12.0 1571                   1                                   | 999+
   T   12.0    0                   1                                   |    F
   R   12.0   63    73 2822 0.026  1        0.183  517  0.142   13.3 B|
   LT  12.0 1571  1746 1791 0.975  1        0.183  328  5.316*  999+ F|
-----------------------------------------------------------------------+-----
EB T   12.0  860  1051 5643 0.186    3      0.450 2539  0.414*   7.3 B|  7.2
   R   12.0  156   173 1590 0.109    3      0.450  715  0.242    6.6 B|    B
-----------------------------------------------------------------------+-----
WB L   12.0  126   140 1787 0.078  2        0.217  387  0.362*  15.4 C|  6.6
   T   12.0  225   263 3762 0.070  23       0.717 2696  0.097    1.7 A|    B
=============================================================================
*=CRITICAL LANE GROUP          DELAY= 999+ SEC/VEH   V/C =1.38    LOS=F
=============================================================================
INT=96WEVENT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 WITH PROJECT CONDITIONS                05/10/95
===========================================================================
INTERSECTION     2 I-805 NB RAMPS/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                   ACTUATED,NON-CBD
                    0    0    0                         80-SEC CYCLE
                    |    |    |                     PHASE     GRN Y+R LOST
         ^          |    |    |          ^          -------- --- --- ----
         |        <---   v   --->        |          1 N-LTR   20   4  3.0
  186 ---   1.0   0.0  0.0  0.0   1.0 ---    162    2 E-LT    17   4  3.0
                                                    3 E-T     31   4  3.0
 2262 ---> 2.0  (NO. OF LANES)   3.0<---    105       W-TR

    0 ---   0.0   1.1  1.1  2.0   0.0 ---      0
         |        <---   ^   --->        |
         v          |    |    |          v
  N                 |    |    |
W + E              211   0  611
  S
============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR       FLOW
----------------------------------------------------------------------------
               12345678                  LT TH RT     LEFT THRU RGHT
NB     0   10   3        5   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
SB     0   10   3
EB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
============================================================================
      LANE             ADJ        PHASE                         LANE  L|APRCH
LANE  WIDTH        ADJ  SAT       ORDER                         GROUP O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S  12345678  G/C CAPAC  V/C      DELAY S|& LOS
------------------------------------------------------------------------+-----
NB L   12.0  211                  1                                     | 29.6
   T   12.0    0                  1                                     |    D
   R   12.0  611   713 2822 0.253 1        0.263  741  0.962* 34.0 D|
   LT  12.0  211   234 1791 0.131 1        0.263  470  0.499  16.8 C|
------------------------------------------------------------------------+-----
EB L   12.0  186   207 1787 0.116  2       0.225  402  0.514  21.6 C| 35.1
   T   12.0 2262  2639 3762 0.701  23      0.663 2492  1.059* 36.3 D|    D
------------------------------------------------------------------------+-----
WB T   12.0  105   128 5643 0.023    3     0.400 2257  0.057   9.5 B| 10.1
   R   12.0  162   180 1590 0.113    3     0.400  636  0.283  10.5 B|    B
============================================================================
*=CRITICAL LANE GROUP          DELAY= 32.0 SEC/VEH   V/C =1.03    LOS=D
============================================================================
INT=96WEVENT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 WITH PROJECT CONDITIONS                    05/10/95
===============================================================================
INTERSECTION     3 OLEANDER AVENUE/OTAY VALLEY ROAD  CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
-------------------------------------------------------------------------------
85 HCM Operations                                      ACTUATED,NON-CBD
                        45    5   40                      120-SEC CYCLE
                         |    |    |                   PHASE     GRN Y+R LOST
           ^             |    |    |          ^        -------- --- --- ----
           |          <---    v    --->       |        1 NS-LTR  22   4  3.0
   36 ---   1.0    1.1  1.1  1.0    1.1 ---     10     2 EW-L     6   4  3.0
                                                       3 EW-TR   80   4  3.0
 2849 ---> 3.1   (NO. OF LANES)     3.1<---    180

    5 ---   1.1    1.1  1.1  1.1    1.0 ---      5
           |      <---    ^    --->      |
           v             |    |    |      v
  N                      |    |    |
W + E                    5    5    5
  S
===============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR        FLOW
-------------------------------------------------------------------------------
               12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10    3     15   N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
SB      0   10    3     15   N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
EB      0   10 1        22   N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
WB      0   10 1        22   N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
===============================================================================
      LANE             ADJ         PHASE                          LANE  L|APRCH
LANE  WIDTH       ADJ  SAT         ORDER                          GROUP O|DELAY
GROUP (FT.)  VOL  VOL FLOW   V/S  12345678  G/C CAPAC   V/C      DELAY S|& LOS
---------------------------------------------------------------------------+-----
NB L   12.0    5                  1                                       | 25.6
   T   12.0    5                  1                                       |    D
   R   12.0    5                  1                                       |
   LTR 12.0   15   17 1565 0.011  1        0.192  300  0.056   25.6 D|
---------------------------------------------------------------------------+-----
SB L   12.0   40   44 1709 0.026  1        0.192  328  0.136   30.6 D| 28.2
   T   12.0    5                  1                                       |    D
   R   12.0   45                  1                                       |
   TR  12.0   50   56 1619 0.034  1        0.192  310  0.179*  26.3 D|
---------------------------------------------------------------------------+-----
EB L   12.0   36   40 1787 0.022   2       0.058  104  0.384*  42.5 E| 13.6
   T   12.0 2849                    3                                     |    B
   R   12.0    5                    3                                     |
   TR  12.0 2854 3488 5641 0.618    3      0.675 3808  0.916*  13.3 B|
---------------------------------------------------------------------------+-----
WB L   12.0    5    6 1787 0.003   2       0.058  104  0.053   40.6 E|  5.2
   T   12.0  180                    3                                     |    B
   R   12.0   10                    3                                     |
   TR  12.0  190  232 5597 0.041    3      0.675 3778  0.061    4.3 A|
===============================================================================
*=CRITICAL LANE GROUP               DELAY= 13.6 SEC/VEH    V/C =0.73    LOS=B
===============================================================================
INT=96WEVENT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 WITH PROJECT CONDITIONS                 05/10/95
============================================================================
INTERSECTION     4 BRANDYWINE AVE/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
----------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                   41    10  140                        120-SEC CYCLE
                    |    |    |                      PHASE     GRN Y+R LOST
         ^          |    |    |            ^         -------- --- --- ----
         |        <---   v   --->          |         1 NS-LTR  22   4  3.0
   51 ---  1.0   1.1  1.1  1.0   1.1 ---     10      2 EW-L     9   4  3.0
                                                     3 EW-TR   77   4  3.0
 2828 ---> 3.1   (NO. OF LANES)   3.1<---   148

   15 ---  1.1   1.0  1.1  1.1   1.0 ---     10
         |        <---   ^   --->          |
         v          |    |    |            v
  N                 |    |    |
W + E              10    5   10
  S
=============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH    TYP     FACTOR        FLOW
-----------------------------------------------------------------------------
                12345678                LT TH RT      LEFT THRU RGHT
NB     0   10    3      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
SB     0   10    3      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
EB     0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
WB     0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
=============================================================================
      LANE              ADJ        PHASE                           LANE  L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                           GROUP O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S  12345678  G/C CAPAC  V/C         DELAY S|& LOS
---------------------------------------------------------------------------+-----
NB L   12.0   10    11 1538 0.007 1         0.192  295  0.038   30.0 D| 27.4
   T   12.0    5                  1                                   |    D
   R   12.0   10                  1                                   |
   TR  12.0   15    17 1687 0.010 1         0.192  323  0.052   25.6 D|
---------------------------------------------------------------------------+-----
SB L   12.0  140   156 1716 0.091 1         0.192  329  0.473*  33.6 D| 31.6
   T   12.0   10                  1                                   |    D
   R   12.0   41                  1                                   |
   TR  12.0   51    57 1647 0.034 1         0.192  316  0.180   26.3 D|
---------------------------------------------------------------------------+-----
EB L   12.0   51    57 1787 0.032  2        0.083  149  0.381*  40.4 E| 16.9
   T   12.0 2828                    3                                 |    C
   R   12.0   15                    3                                 |
   TR  12.0 2843 3475 5638 0.616    3       0.650 3665  0.948*  16.4 C|
---------------------------------------------------------------------------+-----
WB L   12.0   10    11 1787 0.006  2        0.083  149  0.075   38.6 D|  6.9
   T   12.0  148                    3                                 |    B
   R   12.0   10                    3                                 |
   TR  12.0  158   193 5588 0.035   3       0.650 3632  0.053    4.9 A|
=================================================================================
*=CRITICAL LANE GROUP              DELAY= 17.3 SEC/VEH   V/C =0.80    LOS=C
=================================================================================
INT=96WEVENT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 WITH PROJECT CONDITIONS                05/10/95
===========================================================================
INTERSECTION     5 HERITAGE ROAD/OTAY MESA ROAD       CITY OF SAN DIEGO
Count Date                    Time                   Peak Hour
---------------------------------------------------------------------------
85 HCM Operations                                      ACTUATED,NON-CBD
                 347   25   65                             80-SEC CYCLE
                  |     |    |                         PHASE     GRN Y+R LOST
      ^           |     |    |               ^         -------- --- --- ----
      |          <---   v   --->             |         1 NS-L     8   4  3.0
  138 ---  1.0    1.1  1.1  1.0   1.0 ---   520        2 NS-TR   18   4  3.0
                                                       3 EW-L     8   4  3.0
  780 ---> 2.1   (NO. OF LANES)   2.0<---   944        4 EW-TR   30   4  3.0

   36 ---  1.1    1.0  1.1  1.1   1.0 ---    10
      |          <---   ^   --->             |
      v           |     |    |               v
  N               |     |    |
W + E            133   10   41
  S
===========================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR       FLOW
---------------------------------------------------------------------------
               12345678                 LT TH RT      LEFT THRU RGHT
NB     0   10     4     15  N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
SB    50   10     4     15  N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
EB     0   10  2        18  N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
WB   100   10  2        18  N   0.0  0   2  2  2   3  0.90 0.90 0.90  1900
===========================================================================
      LANE              ADJ        PHASE                       LANE  L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                       GROUP O|DELAY
GROUP (FT.)  VOL   VOL FLOW  V/S  12345678  G/C CAPAC  V/C     DELAY S|& LOS
---------------------------------------------------------------------+-----
NB L   12.0  133   148 1787 0.083 1         0.113  201  0.735* 34.9 D| 29.5
   T   12.0   10                   2                                 |    D
   R   12.0   41                   2                                 |
   TR  12.0   51    57 1647 0.034  2        0.238  391  0.145  15.6 C|
---------------------------------------------------------------------+-----
SB L   12.0   65    72 1787 0.040 1         0.113  201  0.359  25.4 D| 35.8
   T   12.0   25                   2                                 |    D
   R   12.0  347                   2                                 |
   TR  12.0  372   358 1612 0.222  2        0.238  383  0.935* 37.6 D|
---------------------------------------------------------------------+-----
EB L   12.0  138   153 1787 0.086   3       0.113  201  0.763* 36.7 D| 17.0
   T   12.0  780                     4                               |    C
   R   12.0   36                     4                               |
   TR  12.0  816   952 3736 0.255    4      0.388 1448  0.658  13.7 B|
---------------------------------------------------------------------+-----
WB L   12.0   10    11 1787 0.006   3       0.113  201  0.055  24.1 C| 15.8
   T   12.0  944  1101 3762 0.293    4      0.388 1458  0.755  15.1 C|    C
   R   12.0  520   467 1590 0.294    4      0.388  616  0.757* 16.9 C|
===========================================================================
*=CRITICAL LANE GROUP          DELAY= 19.9 SEC/VEH   V/C =0.80    LOS=C
===========================================================================
INT=96WEVENT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: OPENING DAY 1996 W/PROJECT MITIGATED CONDITION         05/10/95
===========================================================================
INTERSECTION     1 I-805 SB RAMPS/MAIN STREET        CITY OF CHULA VISTA
Count Date OPENING DAY 1996  Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                  ACTUATED,NON-CBD
                    63    0 1571                       70-SEC CYCLE
                     |    |   |                    PHASE     GRN Y+R LOST
        ^            |    |   |            ^       -------- --- --- ----
        |          <---   v   --->         |       1 S-LTR   30   4  3.0
    0 ---   0.0    2.1  1.1  2.1    0.0 ---     0  2 W-LT    10   4  3.0
                                                   3 E-TR    18   4  3.0
  860 ---> 3.0   (NO. OF LANES)     2.0<---   225    W-T

  156 ---   1.0    0.0  0.0  0.0    1.0 ---   126
        |          <---   ^   --->         |
        v            |    |   |            v
   N                 |    |   |
 W + E               0    0   0
   S
===========================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR    PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH    TYP      FACTOR       FLOW
---------------------------------------------------------------------------
               12345678                  LT TH RT      LEFT THRU RGHT
NB     0   10    3
SB     0   10    3       5   N  0.0  0    2  2  2  3   0.90 0.90 0.90  1900
EB     0    0           15   N  0.0  0    2  2  2  3   0.90 0.90 0.90  1900
WB     0    0           15   N  0.0  0    2  2  2  3   0.90 0.90 0.90  1900
===========================================================================
      LANE             ADJ        PHASE                        LANE   L|APRCH
LANE  WIDTH       ADJ  SAT        ORDER                        GROUP  O|DELAY
GROUP (FT.)  VOL  VOL FLOW  V/S  12345678  G/C CAPAC   V/C     DELAY  S|& LOS
---------------------------------------------------------------------+-----
SB L   12.0 1571                 1                                    | 13.0
   T   12.0    0                 1                                    |    B
   R   12.0   63                 1                                    |
   LTR 12.0 1634 1997 5353 0.373 1         0.443 2371  0.842* 13.0 B  |
---------------------------------------------------------------------+-----
EB T   12.0  860 1051 5643 0.186   3       0.271 1532  0.686* 15.5 C  | 15.3
   R   12.0  156  173 1590 0.109   3       0.271  432  0.402  13.8 B  |    C
---------------------------------------------------------------------+-----
WB L   12.0  126  140 1787 0.078  2        0.157  281  0.499* 21.7 C  | 12.1
   T   12.0  225  263 3762 0.070  23       0.471 1774  0.148   6.8 B  |    B
===========================================================================
*=CRITICAL LANE GROUP           DELAY= 13.7 SEC/VEH   V/C =0.70    LOS=B
===========================================================================
INT=96MIT.INT,VOL=96WEVENT.PMV,CAP=...LOSCAP.TAB
```

# Appendix D

## Peak Hour Intersection Capacity Worksheets

- Interim Year 2010 Background Conditions

```
Condition: INTERIM YEAR 2010 BACKGROUND CONDITIONS                05/10/95
===========================================================================
INTERSECTION     1 I-805 SB RAMPS/MAIN STREET        CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                 285    0  285                           60-SEC CYCLE
                  |     |   |                        PHASE     GRN Y+R LOST
       ^          |     |   |            ^           --------  --- --- ----
       |         <---   v   --->         |           1 S-LTR    20   4  3.0
   0 ---   0.0   2.0  1.1  1.1     0.0 ---     0     2 W-LT     14   4  3.0
                                                     3 E-TR     14   4  3.0
 430 ---> 3.0   (NO. OF LANES)     2.0<---   540       W-T

 210 ---   1.0   0.0  0.0  0.0     1.0 ---   205
       |         <---   ^   --->         |
       v          |     |   |            v
  N               |     |   |
W + E             0     0   0
  S
============================================================================
   RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH   TYP     FACTOR        FLOW
----------------------------------------------------------------------------
              12345678                  LT TH RT     LEFT THRU RGHT
NB      0   10   3
SB      0   10   3       5   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
EB      0    0          15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB      0    0          15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
============================================================================
     LANE             ADJ        PHASE                        LANE  L|APRCH
LANE  WIDTH       ADJ  SAT        ORDER                       GROUP O|DELAY
GROUP (FT.)  VOL  VOL FLOW  V/S  12345678  G/C CAPAC  V/C     DELAY S|& LOS
-------------------------------------------------------------------+-----
SB L   12.0  285                 1                                   |  9.9
   T   12.0    0                 1                                   |    B
   R   12.0  285  333 2822 0.118 1        0.350  988  0.337    9.3 B|
   LT  12.0  285  317 1791 0.177 1        0.350  627  0.505* 10.4 B|
-------------------------------------------------------------------+-----
EB T   12.0  430  526 5643 0.093   3      0.250 1411  0.373   12.1 B| 12.8
   R   12.0  210  233 1590 0.147   3      0.250  397  0.587* 14.2 B|    B
-------------------------------------------------------------------+-----
WB L   12.0  205  228 1787 0.127  2       0.250  447  0.510* 15.5 C|  7.7
   T   12.0  540  630 3762 0.167  23      0.550 2069  0.304    4.7 A|    B
============================================================================
*=CRITICAL LANE GROUP          DELAY= 10.0 SEC/VEH   V/C =0.50   LOS=B
============================================================================
INT=10BCKGND.INT,VOL=10BCKGND.PMV,CAP=...LOSCAP.TAB
```

```
Condition: INTERIM YEAR 2010 BACKGROUND CONDITIONS                  05/10/95
============================================================================
INTERSECTION     2 I-805 NB RAMPS/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
----------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                   0    0    0                           60-SEC CYCLE
                   |    |    |                       PHASE     GRN Y+R LOST
                   |    |    |                       --------  --- --- ----
        |        <---   v   --->        |            1 N-LTR    11   4  3.0
  165 ---   1.0   0.0  0.0  0.0   1.0 ---   300      2 E-LT     16   4  3.0
                                                     3 E-T      21   4  3.0
  550 ---> 2.0  (NO. OF LANES)    3.0<---   525        W-TR

    0 ---   0.0   1.1  1.1  2.0   0.0 ---     0
        |        <---   ^   --->        |
        v          |    |    |          v
  N                |    |    |
W + E             220   0  175
  S
=============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR    PEAK HOUR      SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP     FACTOR       FLOW
-----------------------------------------------------------------------------
               12345678                LT TH RT      LEFT THRU RGHT
NB     0   10   3         5   N   0.0  0    2  2  2  3  0.90 0.90 0.90   1900
SB     0   10   3
EB     0    0            15   N   0.0  0    2  2  2  3  0.90 0.90 0.90   1900
WB     0    0            15   N   0.0  0    2  2  2  3  0.90 0.90 0.90   1900
=============================================================================
      LANE             ADJ      PHASE                          LANE  L|APRCH
LANE  WIDTH        ADJ  SAT     ORDER                          GROUP O|DELAY
GROUP (FT.)   VOL  VOL FLOW  V/S  12345678  G/C CAPAC  V/C     DELAY S|& LOS
----------------------------------------------------------------------+-----
NB L   12.0   220                 1                                   | 15.7
   T   12.0     0                 1                                   |    C
   R   12.0   175  204 2822 0.072 1         0.200  564  0.362   13.5 B|
   LT  12.0   220  244 1791 0.136 1         0.200  358  0.682* 17.4 C|
----------------------------------------------------------------------+-----
EB L   12.0   165  183 1787 0.103  2        0.283  506  0.362* 13.3 B|  4.7
   T   12.0   550  642 3762 0.171  23       0.700 2633  0.244    2.1 A|    A
----------------------------------------------------------------------+-----
WB T   12.0   525  642 5643 0.114   3       0.367 2069  0.310    8.8 B|  9.5
   R   12.0   300  333 1590 0.210   3       0.367  583  0.572* 10.7 B|    B
=============================================================================
*=CRITICAL LANE GROUP            DELAY=  9.0 SEC/VEH   V/C =0.50    LOS=B
=============================================================================
INT=10BCKGND.INT,VOL=10BCKGND.PMV,CAP=...LOSCAP.TAB
```

```
Condition: INTERIM YEAR 2010 BACKGROUND CONDITIONS                     05/10/95
===============================================================================
INTERSECTION     3 OLEANDER AVENUE/OTAY VALLEY ROAD  CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
-------------------------------------------------------------------------------
85 HCM Operations                                       ACTUATED,NON-CBD
                        80   10   75                        72-SEC CYCLE
                         |    |    |                    PHASE     GRN Y+R LOST
        ^                |    |    |           ^        -------- --- --- ----
        |              <---   v   --->         |        1 NS-LTR  22   4  3.0
  110 ---   1.0   1.1  1.1  1.0   1.1 ---    70         2 EW-L    10   4  3.0
                                                        3 EW-TR   28   4  3.0
  775 ---> 3.1  (NO. OF LANES)   3.1<---  735

   10 ---   1.1   1.1  1.1  1.1   1.0 ---    10
        |       <---    ^   --->        |
        v                |    |    |           v
  N                      |    |    |
W + E                   10   10   10
  S
===============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR        SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP    FACTOR          FLOW
-------------------------------------------------------------------------------
               12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10   3       15   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
SB      0   10   3       15   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
EB      0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
WB      0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90   1900
===============================================================================
       LANE               ADJ         PHASE                         LANE  L|APRCH
LANE  WIDTH          ADJ  SAT         ORDER                         GROUP O|DELAY
GROUP (FT.)   VOL    VOL FLOW  V/S   12345678  G/C CAPAC   V/C      DELAY S|& LOS
-----------------------------------------------------------------------+-----
NB L    12.0   10                     1                                  | 11.0
   T    12.0   10                     1                                  |    B
   R    12.0   10                     1                                  |
   LTR  12.0   30     33 1554 0.021 1          0.319  496  0.067   11.0 B|
-----------------------------------------------------------------------+-----
SB L    12.0   75     83 1690 0.049 1          0.319  540  0.154   13.3 B| 12.3
   T    12.0   10                     1                                  |    B
   R    12.0   80                     1                                  |
   TR   12.0   90    100 1622 0.062 1          0.319  518  0.193*  11.5 B|
-----------------------------------------------------------------------+-----
EB L    12.0  110    122 1787 0.068  2         0.153  273  0.448*  21.9 C| 11.5
   T    12.0  775                     3                                  |    B
   R    12.0   10                     3                                  |
   TR   12.0  785    959 5632 0.170   3        0.403 2268  0.423   10.1 B|
-----------------------------------------------------------------------+-----
WB L    12.0   10     11 1787 0.006  2         0.153  273  0.041   19.8 C| 10.3
   T    12.0  735                     3                                  |    B
   R    12.0   70                     3                                  |
   TR   12.0  805    984 5567 0.177   3        0.403 2242  0.439*  10.2 B|
===============================================================================
*=CRITICAL LANE GROUP          DELAY= 11.0 SEC/VEH    V/C =0.35    LOS=B
===============================================================================
INT=10BCKGND.INT,VOL=10BCKGND.PMV,CAP=...LOSCAP.TAB
```

```
Condition: INTERIM YEAR 2010 BACKGROUND CONDITIONS                  05/10/95
===========================================================================
INTERSECTION     4 BRANDYWINE AVE/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 BACKGRND   Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                 225   30  230                           84-SEC CYCLE
                  |    |   |                         PHASE     GRN Y+R LOST
        -         |    |   |            -
                                                     -------- --- --- ----
        |       <---   v   --->         |            1 NS-LTR  28   4  3.0
  160 ---  1.0   1.1  1.1  1.0   1.1 ---  215        2 EW-L    15   4  3.0
                                                     3 EW-TR   29   4  3.0
  680 ---> 3.1  (NO. OF LANES)   3.1<---  610

   50 ---  1.1   1.0  1.1  1.1   1.0 ---   30
        |       <---   ^   --->         |
        v         |    |   |            v
  N               |    |   |
W + E            35   35   25
  S
===========================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH   TYP    FACTOR        FLOW
---------------------------------------------------------------------------
             . 12345678                   LT TH RT      LEFT THRU RGHT
NB     0   10    3       15   N   0.0  0    2  2  2  3  0.90 0.90 0.90  1900
SB    50   10    3       15   N   0.0  0    2  2  2  3  0.90 0.90 0.90  1900
EB     0   10 1          22   N   0.0  0    2  2  2  3  0.90 0.90 0.90  1900
WB     0   10 1          22   N   0.0  0    2  2  2  3  0.90 0.90 0.90  1900
===========================================================================
      LANE             ADJ        PHASE                        LANE  L|APRCH
LANE  WIDTH        ADJ  SAT       ORDER                        GROUP O|DELAY
GROUP (FT.)   VOL  VOL FLOW  V/S  12345678  G/C CAPAC   V/C    DELAY S|& LOS
----------------------------------------------------------------------+-----
NB L   12.0   35    39 1148 0.034 1        0.345  396  0.098   14.2 B| 12.9
   T   12.0   35                  1                                  |    B
   R   12.0   25                  1                                  |
   TR  12.0   60    67 1760 0.038 1        0.345  608  0.110   12.1 B|
----------------------------------------------------------------------+-----
SB L   12.0  230   256 1551 0.165 1        0.345  535  0.477*  16.9 C| 15.2
   T   12.0   30                  1                                  |    C
   R   12.0  225                  1                                  |
   TR  12.0  255   228 1632 0.140 1        0.345  563  0.404   13.7 B|
----------------------------------------------------------------------+-----
EB L   12.0  160   178 1787 0.099  2       0.190  340  0.522*  24.4 C| 15.4
   T   12.0  680                    3                                |    C
   R   12.0   50                    3                                |
   TR  12.0  730   892 5583 0.160   3      0.357 1994  0.447   13.4 B|
----------------------------------------------------------------------+-----
WB L   12.0   30    33 1787 0.019  2       0.190  340  0.098   21.3 C| 14.2
   T   12.0  610                    3                                |    B
   R   12.0  215                    3                                |
   TR  12.0  825  1008 5415 0.186   3      0.357 1934  0.521*  14.0 B|
===========================================================================
*=CRITICAL LANE GROUP          DELAY= 14.8 SEC/VEH   V/C =0.50    LOS=B
===========================================================================
INT=10BCKGND.INT,VOL=10BCKGND.PMV,CAP=...LOSCAP.TAB
```

Condition: INTERIM YEAR 2010 BACKGROUND CONDITIONS 05/10/95

INTERSECTION 5 HERITAGE ROAD/OTAY MESA ROAD CITY OF SAN DIEGO
Count Date 2010 INTERIM Time 7-8 BACKGRND Peak Hour AMPHITHEATRE

85 HCM Operations

```
                     130  280  225
        -             |    |    |          -
        |           <---   v   --->        |
  145 ---  2.0      1.0  2.0  2.0     1.0 ---   260

  415 ---> 2.1     (NO. OF LANES)     2.0<---   435

   50 ---  1.1      1.0  2.0  1.0     1.0 ---    70
        |           <---   -   --->        |
        v             |    |    |          v
  N
W + E                115  235   60
  S
```

ACTUATED,NON-CBD
100-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 NS-L | 16 | 4 | 3.0 |
| 2 NS-TR | 22 | 4 | 3.0 |
| 3 EW-L | 11 | 4 | 3.0 |
| 4 EW-TR | 35 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 4 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 0 | 10 | 4 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 50 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | L | 12.0 | 115 | 128 | 1787 | 0.072 | 1 | 0.170 | 304 | 0.421 | 28.8 | D | 22.9 |
| | T | 12.0 | 235 | 274 | 3762 | 0.073 | 2 | 0.230 | 865 | 0.317 | 20.7 | C | C |
| | R | 12.0 | 60 | 67 | 1590 | 0.042 | 2 | 0.230 | 366 | 0.182 | 20.0 | C | |
| SB | L | 12.0 | 225 | 263 | 3461 | 0.076 | 1 | 0.170 | 588 | 0.446* | 28.7 | D | 23.8 |
| | T | 12.0 | 280 | 327 | 3762 | 0.087 | 2 | 0.230 | 865 | 0.378 | 21.1 | C | C |
| | R | 12.0 | 130 | 144 | 1590 | 0.091 | 2 | 0.230 | 366 | 0.395* | 21.4 | C | |
| EB | L | 12.0 | 145 | 169 | 3461 | 0.049 | 3 | 0.120 | 415 | 0.407* | 31.3 | D | 19.3 |
| | T | 12.0 | 415 | | | | 4 | | | | | | C |
| | R | 12.0 | 50 | | | | 4 | | | | | | |
| | TR | 12.0 | 465 | 542 | 3699 | 0.147 | 4 | 0.360 | 1332 | 0.407 | 15.6 | C | |
| WB | L | 12.0 | 70 | 78 | 1787 | 0.044 | 3 | 0.120 | 214 | 0.363 | 31.2 | D | 16.9 |
| | T | 12.0 | 435 | 507 | 3762 | 0.135 | 4 | 0.360 | 1354 | 0.375 | 15.4 | C | C |
| | R | 12.0 | 260 | 233 | 1590 | 0.147 | 4 | 0.360 | 572 | 0.408* | 15.7 | C | |

*=CRITICAL LANE GROUP DELAY= 20.4 SEC/VEH V/C =0.41 LOS=C

INT=10BCKGND.INT,VOL=10BCKGND.PMV,CAP=...LOSCAP.TAB

# Appendix E

## Peak Hour Intersection Capacity Worksheets

- Interim Year 2010 With Project Conditions

Condition: INTERIM YEAR 2010 WITH PROJECT CONDITIONS 05/10/95

INTERSECTION 1 I-805 SB RAMPS/MAIN STREET CITY OF CHULA VISTA
Count Date 2010 INTERIM Time 7-8 W/PROJECT Peak Hour AMPHITHEATRE

```
85 HCM Operations
                     285     0 1785
                      |      |   |
                      |      |   |
          |         <---     v   --->         |
    0 ---   0.0     2.0    1.1   1.1    0.0 ---      0

 1095 ---> 3.0     (NO. OF LANES)       2.0<---    540

  210 ---   1.0     0.0    0.0   0.0    1.0 ---    205
          |         <---           --->         |
          v           |      |    |             v
   N                  |      |    |
 W + E                0      0    0
   S
```

ACTUATED,NON-CBD
80-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 S-LTR | 30 | 4 | 3.0 |
| 2 W-LT | 15 | 4 | 3.0 |
| 3 E-TR W-T | 23 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 3 | | | | | | | | | | | | |
| SB | 0 | 10 | 3 | 5 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 0 | 0 | | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB | L | 12.0 | 1785 | | | | 1 | | | | | | 999+ |
| | T | 12.0 | 0 | | | | 1 | | | | | | F |
| | R | 12.0 | 285 | 333 | 2822 | 0.118 | 1 | 0.388 | 1094 | 0.304 | 11.0 | B | |
| | LT | 12.0 | 1785 | 1983 | 1791 | 1.107 | 1 | 0.388 | 694 | 2.858* | 999+ | F | |
| EB | T | 12.0 | 1095 | 1338 | 5643 | 0.237 | 3 | 0.300 | 1693 | 0.791* | 18.2 | C | 17.7 |
| | R | 12.0 | 210 | 233 | 1590 | 0.147 | 3 | 0.300 | 477 | 0.489 | 15.4 | C | C |
| WB | L | 12.0 | 205 | 228 | 1787 | 0.127 | 2 | 0.200 | 357 | 0.637* | 24.9 | C | 11.7 |
| | T | 12.0 | 540 | 630 | 3762 | 0.167 | 23 | 0.538 | 2022 | 0.312 | 6.7 | B | B |

*=CRITICAL LANE GROUP DELAY= 999+ SEC/VEH V/C =1.59 LOS=F

INT=10WEVENT.INT,VOL=10WEVENT.PMV,CAP=...LOSCAP.TAB

```
Condition: INTERIM YEAR 2010 WITH PROJECT CONDITIONS              05/10/95
===========================================================================
INTERSECTION     2 I-805 NB RAMPS/OTAY VALLEY ROAD   CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
---------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                         0    0    0                    120-SEC CYCLE
                         |    |    |                 PHASE     GRN Y+R LOST
        -                |    |    |          -      -------- --- --- ----
        |           <---    v    --->         |      1 N-LTR   18   4  3.0
  165 ---  1.0   0.0  0.0  0.0   1.0 ---   300       2 E-LT    25   4  3.0
                                                     3 E-T     65   4  3.0
 2715 ---> 2.0   (NO. OF LANES)  3.0<---   525         W-TR

    0 ---  0.0   1.1  1.1  2.0   0.0 ---     0
        |           <---    ^    --->         |
        v                |    |    |          v
  N                      |    |    |
W + E                   220   0  175
  S
============================================================================
    RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY  ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP    VEH  TYP     FACTOR        FLOW
----------------------------------------------------------------------------
              12345678                  LT TH RT      LEFT THRU RGHT
NB     0   10   3        5   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
SB     0   10   3
EB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB     0    0           15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
============================================================================
       LANE               ADJ       PHASE                      LANE  L|APRCH
LANE  WIDTH         ADJ   SAT       ORDER                      GROUP O|DELAY
GROUP (FT.)  VOL    VOL  FLOW  V/S  12345678  G/C CAPAC  V/C   DELAY S|& LOS
-------------------------------------------------------------------+-----
NB L   12.0  220                    1                                 | 38.5
   T   12.0    0                    1                                 |    D
   R   12.0  175   204 2822 0.072 1      0.158  447  0.457   30.1 D|
   LT  12.0  220   244 1791 0.136 1      0.158  284  0.862* 45.1 E|
-------------------------------------------------------------------+-----
EB L   12.0  165   183 1787 0.103  2     0.217  387  0.474   31.9 D| 37.3
   T   12.0 2715  3167 3762 0.842  23    0.792 2978  1.064* 37.6 D|    D
-------------------------------------------------------------------+-----
WB T   12.0  525   642 5643 0.114   3    0.550 3104  0.207    8.9 B|  9.3
   R   12.0  300   333 1590 0.210   3    0.550  874  0.381   10.1 B|    B
============================================================================
*=CRITICAL LANE GROUP          DELAY= 31.8 SEC/VEH   V/C =1.03     LOS=D
============================================================================
INT=10WEVENT.INT,VOL=10WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: INTERIM YEAR 2010 WITH PROJECT CONDITIONS                05/10/95
============================================================================
INTERSECTION     3 OLEANDER AVENUE/OTAY VALLEY ROAD  CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
----------------------------------------------------------------------------
85 HCM Operations                                    ACTUATED,NON-CBD
                  80    10  105                         120-SEC CYCLE
                   |     |   |                       PHASE     GRN Y+R LOST
        ^          |     |   |            ^          -------- --- --- ----
        |        <---    v   --->         |          1 NS-LTR  22   4  3.0
  110 ---   1.0   1.1   1.1  1.0    1.1 ---    70    2 EW-L     5   4  3.0
                                                     3 E-LTR   12   4  3.0
 2940 ---> 3.1   (NO. OF LANES)     3.1<---   735    4 EW-TR   65   4  3.0

   10 ---   1.1   1.1   1.1  1.1    1.0 ---    10
        |        <---    ^   --->         |
        v          |     |   |            v
  N                |     |   |
W + E             10    10   10
  S
=============================================================================
   RTOR CNFL  PED W/  MIN PRK   %  BUS   %HVY   ARR   PEAK HOUR       SAT
APP  VPH PEDS  PHASE   GRN ING  GRA STP   VEH   TYP    FACTOR        FLOW
-----------------------------------------------------------------------------
              12345678                  LT TH RT      LEFT THRU RGHT
NB      0   10   34      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
SB      0   10    4      15   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
EB      0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
WB      0   10 1         22   N   0.0  0   2  2  2  3  0.90 0.90 0.90  1900
=============================================================================
     LANE               ADJ        PHASE                         LANE  L|APRCH
LANE  WIDTH        ADJ  SAT        ORDER                         GROUP O|DELAY
GROUP (FT.)   VOL  VOL FLOW  V/S  12345678  G/C CAPAC  V/C      DELAY S|& LOS
----------------------------------------------------------------------+-----
NB L    12.0   10                  1                                    | 25.9
   T    12.0   10                  1                                    |    D
   R    12.0   10                  1                                    |
   LTR  12.0   30   33 1447 0.023  1       0.192  277  0.120    25.9 D|
----------------------------------------------------------------------+-----
SB L    12.0  105  117 1627 0.072  1       0.192  312  0.374*  32.5 D| 30.0
   T    12.0   10                  1                                    |    D
   R    12.0   80                  1                                    |
   TR   12.0   90  100 1622 0.062  1       0.192  311  0.322    27.2 D|
----------------------------------------------------------------------+-----
EB L    12.0  110  122 1787 0.068   23     0.183  328  0.373    33.0 D| 14.7
   T    12.0 2940                    34                                 |    B
   R    12.0   10                    34                                 |
   TR   12.0 2950 3606 5640 0.639    34    0.683 3854  0.936*  14.0 B|
----------------------------------------------------------------------+-----
WB L    12.0   10   11 1787 0.006   2      0.050   89  0.124*  41.4 E|  9.9
   T    12.0  735                    4                                  |    B
   R    12.0   70                    4                                  |
   TR   12.0  805  984 5567 0.177    4     0.550 3062  0.321     9.6 B|
=============================================================================
*=CRITICAL LANE GROUP          DELAY= 14.6 SEC/VEH   V/C =0.75   LOS=B
=============================================================================
INT=10WEVENT.INT,VOL=10WEVENT.PMV,CAP=...LOSCAP.TAB
```

```
Condition: INTERIM YEAR 2010 WITH PROJECT CONDITIONS                 05/10/95
==============================================================================
INTERSECTION      4 BRANDYWINE AVE/OTAY VALLEY ROAD    CITY OF CHULA VISTA
Count Date 2010 INTERIM       Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
------------------------------------------------------------------------------
85 HCM Operations                                     ACTUATED,NON-CBD
                          225   30  365                  120-SEC CYCLE
                            |    |    |                PHASE     GRN Y+R LOST
           ^                |    |    |            ^   -------- --- --- ----
           |             <---    v    --->         |   1 NS-L     4   3  3.0
  160 ---   1.0     1.1   1.1   1.0     1.1 ---   215  2 S-LTR   18   4  3.0
                                                       3 NS-TR    5   4  3.0
 2875 ---> 3.1   (NO. OF LANES)     3.1<---   610      4 EW-L     4   3  3.0
                                                       5 E-LTR    9   4  3.0
   50 ---   1.1     1.0   1.1   1.1     1.0 ---    30  6 EW-TR   58   4  3.0
           |             <---    ^    --->         |
           v                |    |    |            v
   N                        |    |    |
W + E                      35   35   25
   S
==============================================================================
```

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 56 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 75 | 10 | 6 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 10 | 3 | 22 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 75 | 10 | 3 | 22 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | LOS | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | L | 12.0 | 35 | 39 | 1787 | 0.022 | 1 | 0.033 | 60 | 0.653 | 58.1 | E | 55.1 |
| | T | 12.0 | 35 | | | | 3 | | | | | | E |
| | R | 12.0 | 25 | | | | 3 | | | | | | |
| | TR | 12.0 | 60 | 67 | 1760 | 0.038 | 3 | 0.050 | 88 | 0.758* | 53.3 | E | |
| SB | L | 12.0 | 365 | 406 | 1787 | 0.227 | 12 | 0.217 | 387 | 1.047* | 85.7 | F | 61.5 |
| | T | 12.0 | 30 | | | | 23 | | | | | | F |
| | R | 12.0 | 225 | | | | 23 | | | | | | |
| | TR | 12.0 | 255 | 200 | 1643 | 0.122 | 23 | 0.233 | 383 | 0.522 | 26.8 | D | |
| EB | L | 12.0 | 160 | 178 | 1787 | 0.099 | 45 | 0.142 | 253 | 0.702 | 43.0 | E | 41.9 |
| | T | 12.0 | 2875 | | | | 56 | | | | | | E |
| | R | 12.0 | 50 | | | | 56 | | | | | | |
| | TR | 12.0 | 2925 | 3575 | 5628 | 0.635 | 56 | 0.600 | 3377 | 1.059* | 41.8 | E | |
| WB | L | 12.0 | 30 | 33 | 1787 | 0.019 | 4 | 0.033 | 60 | 0.560* | 51.3 | E | 13.4 |
| | T | 12.0 | 610 | | | | 6 | | | | | | B |
| | R | 12.0 | 215 | | | | 6 | | | | | | |
| | TR | 12.0 | 825 | 917 | 5480 | 0.167 | 6 | 0.492 | 2694 | 0.340 | 12.1 | B | |

```
==============================================================================
*=CRITICAL LANE GROUP            DELAY= 39.5 SEC/VEH   V/C =0.97    LOS=D
==============================================================================
INT=10WEVENT.INT,VOL=10WEVENT.PMV,CAP=...LOSCAP.TAB
```

Condition: INTERIM YEAR 2010 WITH PROJECT CONDITIONS 05/10/95

INTERSECTION 5 HERITAGE ROAD/OTAY MESA ROAD CITY OF SAN DIEGO
Count Date 2010 INTERIM Time 7-8 W/PROJECT Peak Hour AMPHITHEATRE

85 HCM Operations

```
                    130   280   225
                     |     |     |
        ^            |     |     |           ^
        |          <---    v    --->         |
 645 ---   2.0     1.0   2.0   2.0     1.0 ---   760

 415 ---> 2.1     (NO. OF LANES)       2.0<---   435

  50 ---   1.1     1.0   2.0   1.0     1.0 ---    70
        |          <---    ^    --->         |
        v            |     |     |           v
  N                  |     |     |
W + E               115   235    60
  S
```

ACTUATED,NON-CBD
120-SEC CYCLE

| PHASE | GRN | Y+R | LOST |
|---|---|---|---|
| 1 NS-L | 10 | 4 | 3.0 |
| 2 NS-TR | 18 | 4 | 3.0 |
| 3 EW-L | 10 | 4 | 3.0 |
| 4 E-LTR | 12 | 4 | 3.0 |
| 5 EW-TR | 50 | 4 | 3.0 |

| APP | RTOR VPH | CNFL PEDS | PED W/ PHASE 12345678 | MIN GRN | PRK ING | % GRA | BUS STP | %HVY VEH LT | TH | RT | ARR TYP | PEAK HOUR FACTOR LEFT | THRU | RGHT | SAT FLOW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB | 0 | 10 | 45 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| SB | 0 | 10 | 5 | 15 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| EB | 0 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |
| WB | 110 | 10 | 2 | 18 | N | 0.0 | 0 | 2 | 2 | 2 | 3 | 0.90 | 0.90 | 0.90 | 1900 |

| LANE GROUP | LANE WIDTH (FT.) | VOL | ADJ VOL | ADJ SAT FLOW | V/S | PHASE ORDER 12345678 | G/C | CAPAC | V/C | LANE GROUP DELAY | L O S | APRCH DELAY & LOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB L | 12.0 | 115 | 128 | 1787 | 0.072 | 1 | 0.092 | 164 | 0.780 | 54.5 | E | 36.7 |
| T | 12.0 | 235 | 274 | 3762 | 0.073 | 2 | 0.158 | 596 | 0.460 | 30.0 | D | D |
| R | 12.0 | 60 | 67 | 1590 | 0.042 | 2 | 0.158 | 252 | 0.265 | 28.8 | D | |
| SB L | 12.0 | 225 | 263 | 3461 | 0.076 | 1 | 0.092 | 317 | 0.827* | 51.9 | E | 38.6 |
| T | 12.0 | 280 | 327 | 3762 | 0.087 | 2 | 0.158 | 596 | 0.548 | 30.8 | D | D |
| R | 12.0 | 130 | 144 | 1590 | 0.091 | 2 | 0.158 | 252 | 0.574* | 32.2 | D | |
| EB L | 12.0 | 645 | 752 | 3461 | 0.217 | 34 | 0.225 | 779 | 0.966* | 53.0 | E | 34.5 |
| T | 12.0 | 415 | | | | 45 | | | | | | D |
| R | 12.0 | 50 | | | | 45 | | | | | | |
| TR | 12.0 | 465 | 542 | 3699 | 0.147 | 45 | 0.558 | 2065 | 0.263 | 8.9 | B | |
| WB L | 12.0 | 70 | 78 | 1787 | 0.044 | 3 | 0.092 | 164 | 0.475 | 41.0 | E | 45.9 |
| T | 12.0 | 435 | 507 | 3762 | 0.135 | 5 | 0.425 | 1599 | 0.317 | 14.8 | B | E |
| R | 12.0 | 760 | 722 | 1590 | 0.454 | 5 | 0.425 | 676 | 1.069* | 64.1 | F | |

*=CRITICAL LANE GROUP DELAY= 39.7 SEC/VEH V/C =0.91 LOS=D

INT=10WEVENT.INT,VOL=10WEVENT.PMV,CAP=...LOSCAP.TAB

# Appendix F

## Peak Hour Intersection Capacity Worksheets

- Interim Year 2010 With Project Mitigated Conditions

```
Condition: INTERIM 2010 WITH PROJECT MITIGATED CONDITIONS          05/10/95
============================================================================
INTERSECTION      1 I-805 SB RAMPS/MAIN STREET             CITY OF CHULA VISTA
Count Date 2010 INTERIM      Time 7-8 W/PROJECT  Peak Hour AMPHITHEATRE
----------------------------------------------------------------------------
85 HCM Operations                                         ACTUATED,NON-CBD
                        285     0 1785                       120-SEC CYCLE
                            |    |    |                   PHASE     GRN Y+R LOST
            ^               |    |    |            ^      --------  --- --- ----
            |            <---    v    --->         |      1 S-LTR    57   4  3.0
     0 ---   0.0    2.1   1.1   2.1    0.0 ---      0     2 W-LT     21   4  3.0
                                                          3 E-TR     30   4  3.0
  1095 ---> 3.0    (NO. OF LANES)      2.0<---    540       W-T

   210 ---   1.0    0.0   0.0   0.0    1.0 ---    205
            |            <---    ^    --->         |
            v               |    |    |            v
   N                        |    |    |
 W + E                      0    0    0
   S
============================================================================
    RTOR CNFL  PED W/   MIN PRK   %  BUS   %HVY   ARR    PEAK HOUR      SAT
APP  VPH PEDS  PHASE    GRN ING  GRA STP    VEH   TYP     FACTOR        FLOW
----------------------------------------------------------------------------
               12345678                   LT TH RT      LEFT THRU RGHT
NB      0   10   3
SB      0   10   3        5   N   0.0  0    2  2  2  3   0.90 0.90 0.90  1900
EB      0    0           15   N   0.0  0    2  2  2  3   0.90 0.90 0.90  1900
WB      0    0           15   N   0.0  0    2  2  2  3   0.90 0.90 0.90  1900
============================================================================
      LANE                ADJ        PHASE                         LANE   L|APRCH
LANE  WIDTH          ADJ  SAT        ORDER                         GROUP  O|DELAY
GROUP (FT.)   VOL    VOL  FLOW   V/S  12345678  G/C CAPAC   V/C    DELAY  S|& LOS
---------------------------------------------------------------------------+-----
SB L    12.0 1785                     1                                    | 29.5
   T    12.0    0                     1                                    |    D
   R    12.0  285                     1                                    |
   LTR  12.0 2070  2530 5298 0.478  1          0.483 2561  0.988* 29.5 D|
---------------------------------------------------------------------------+-----
EB T    12.0 1095  1338 5643 0.237    3        0.258 1458  0.918* 33.9 D| 32.6
   R    12.0  210   233 1590 0.147    3        0.258  411  0.568  26.2 D|    D
---------------------------------------------------------------------------+-----
WB L    12.0  205   228 1787 0.127  2          0.183  328  0.695* 39.2 D| 20.4
   T    12.0  540   630 3762 0.167  23         0.467 1756  0.359  13.3 B|    C
============================================================================
*=CRITICAL LANE GROUP             DELAY= 28.8 SEC/VEH   V/C =0.89    LOS=D
============================================================================
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```

**Giroux & Associates**
Environmental Consultants

# NOISE IMPACT ANALYSIS

## MCA AMPHITHEATER PROJECT

## CITY OF CHULA VISTA, CALIFORNIA

Prepared for:

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Date:

May 30, 1995

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## NOISE SETTING

Sound is mechanical energy transmitted by pressure waves in a compressible medium such as air. Noise is generally defined as unwanted sound. Sound is characterized by various parameters that describe the rate of oscillation of sound waves, the distance between successive troughs or crests, the speed of propagation, and the pressure level or energy content of a given sound. In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. The decibel (dB) scale is used to quantify sound intensity.

One decibel is the lowest sound presumed detectable by a young person with good auditory acuity. Figure 1 shows the range of environmental noise and the associated human response. Because hearing sensitivity covers a wide threshold of sound strength, the decibel scale is a logarithmic progression where each 10 dB increase represents a ten-fold change in sound level pressure. Auditory response is not linearly related to pressure. Each 10 dB increase in sound is subjectively perceived by people to be a doubling of sound strength.

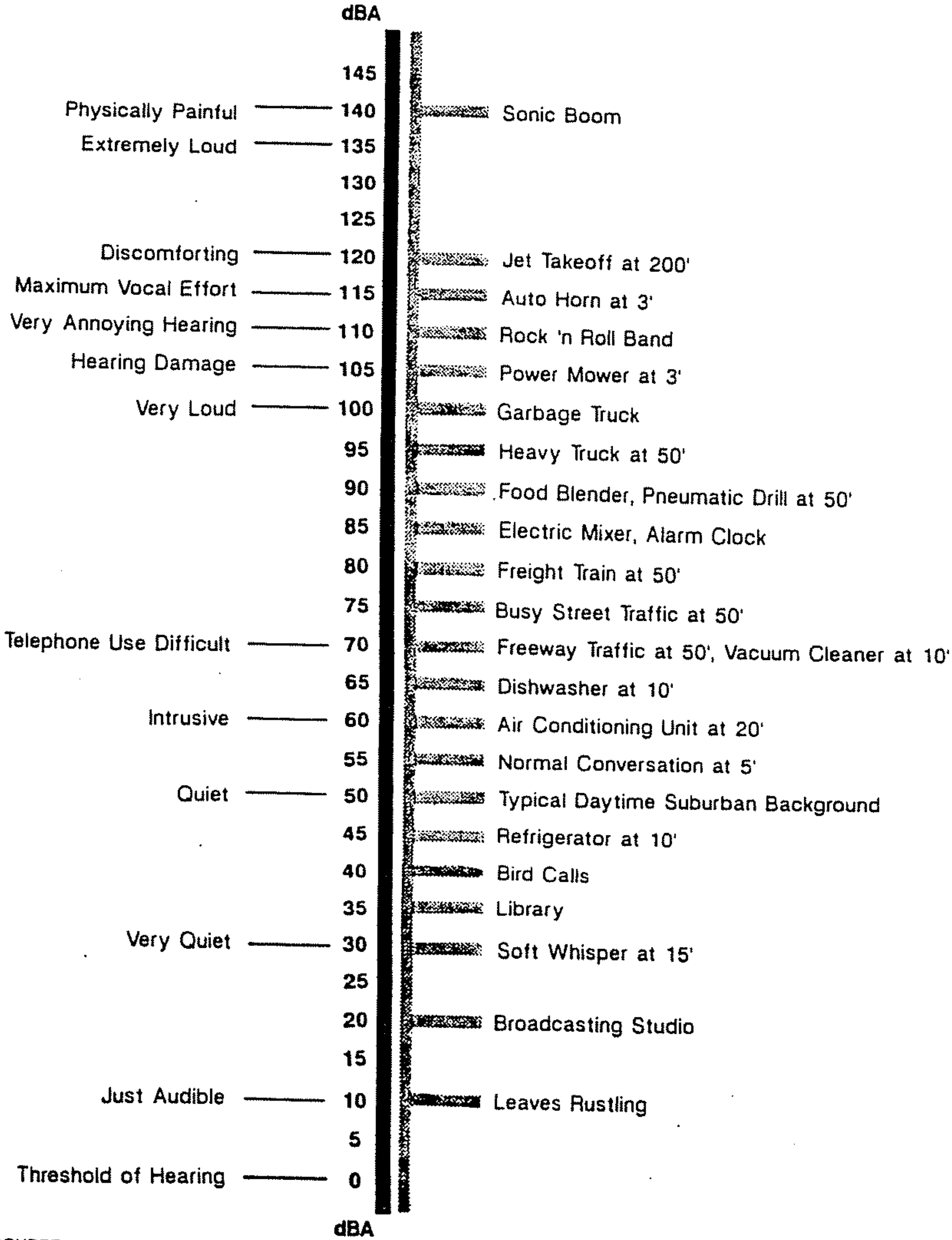
Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response is factored into sound descriptions by weighting sounds within the range of maximum human auditory sensitivity more heavily (middle A and its higher harmonics) in a process called "A-weighting", written as dB(A). Any additional reference to decibels in this report written as "dB" should be understood to be "dB(A)" unless otherwise noted.

Time variations in noise exposure are typically expressed in terms of a steady-state energy level equal to the energy content of the time varying period (called Leq), or alternately, as a statistical description of the sound level that is exceeded over some stated fraction of a given observation period. Finally, because community receptors are more sensitive to unwanted noise intrusion during the evening and at night, state law requires that, for planning purposes, an artificial dB increment be added to quiet time noise levels in a 24-hour noise metric called the Community Noise Equivalent Level (CNEL).

An interior CNEL of 45 dB(A) is mandated for multiple family dwellings, and is considered a desirable noise exposure for single family dwelling units as well. Since typical noise attenuation within structures is about 15-20 dB, an exterior noise exposure of 65 dB CNEL is typically the design exterior noise exposure for new residential dwellings, schools, or other noise-sensitive land uses in California. Because commercial or industrial uses are not occupied on a 24-hour basis, a less stringent noise/land use compatibility criterion is generally specified for these less noise sensitive land uses.

**FIGURE 1**

Sound Levels and Human Response




SOURCE: ADAPTED FROM WILLIAM BRONSON, "EAR POLLUTION," CALIFORNIA HEALTH (OCTOBER, 1971), P. 29

The CNEL metric generally is used as a land-use decision guideline in approving a given type of land use within an existing or predicted future noise environment. It is most often applied to noise exposures from vehicular traffic, trains or other sources whose control is pre-empted by state or federal agencies. In recognizing that noise sensitivity varies among land uses, state and federal agencies have developed guidelines that govern land use siting within given ranges of noise exposure. Four classes of noise exposure are generally recognized as follows:

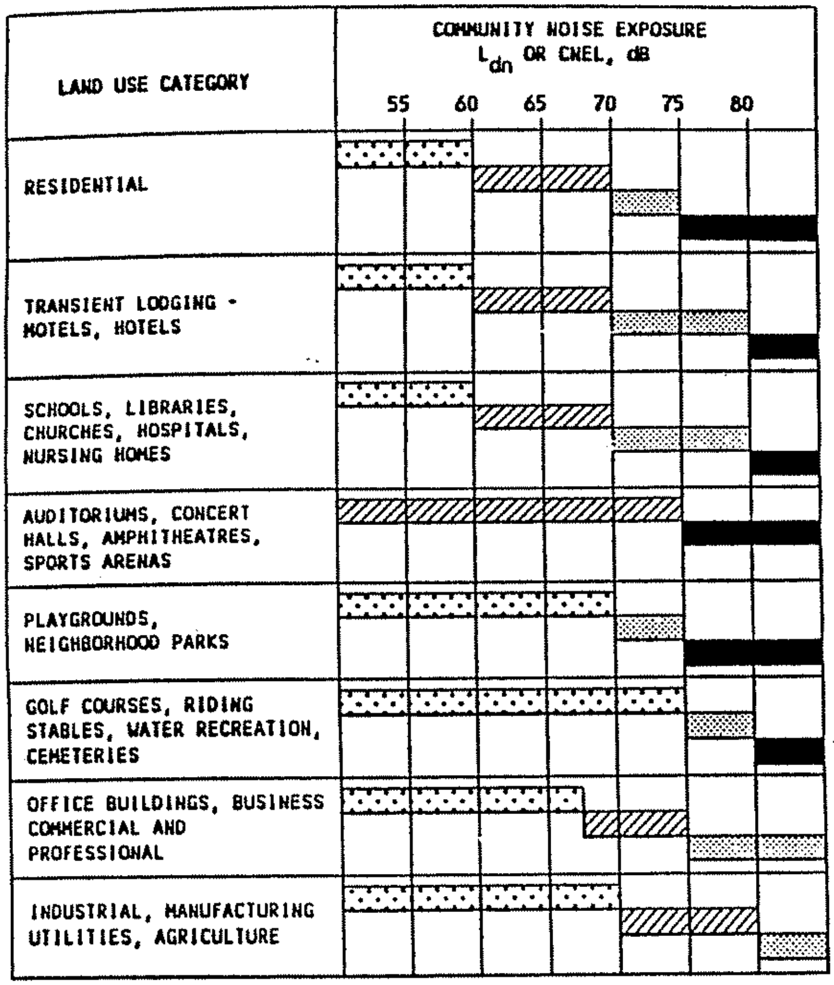
> **Clearly Acceptable** - noise is not likely to interfere with proposed uses.
>
> **Conditionally Acceptable** - noise may be excessive, but standard construction practice is likely to achieve an acceptable interior noise exposure even if the exterior is somewhat excessively noisy.
>
> **Normally Unacceptable** - siting of noise-sensitive uses is not recommended within this range of noise exposure unless there are strongly overriding considerations in siting a proposed project.
>
> **Clearly Unacceptable** - even within mitigation, the residual noise exposure probably will create a noise/land use conflict.

The City of Chula Vista, in the Noise Element of the General Plan, requires that noise exposure be considered in land use decisions, but does not have specific threshold levels in making that decision. For noise sensitive land uses, the City uses 65 dB CNEL as the criterion for acceptability, as do most jurisdictions in San Diego County. Figure B shows the range of recommended noise exposures that should be used as a guideline in land use decision-making processes. Amphitheaters are seen in Figure 2 to be a compatible land use with baseline noise levels up to 75 dB CNEL, although a detailed noise analysis is recommended as part of the siting decision for all ambient noise levels of less than 75 dB CNEL.

CNEL is the appropriate standard for evaluating noise impacts to a receiving property from a source whose control is pre-empted by state or federal law. A generating source of non-mobile noise sources such as an amphitheater, however, may be regulated by the municipal code in its originating jurisdiction. This regulation is typically called the "Noise Ordinance".

# FIGURE 2

## LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENT




**INTERPRETATION**

**NORMALLY ACCEPTABLE**

Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

**CONDITIONALLY ACCEPTABLE**

New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

**NORMALLY UNACCEPTABLE**

New construction or development should generally be discourged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and the needed noise insulation features included in the design.

**CLEARLY UNACCEPTABLE**

New construction or development should generally not be undertaken.

Note: Modified from State guidelines to eliminate overlap on exposure recommendations.

In Chula Vista, a noise ordinance was adopted in 1985 as Ordinance No. 2101 adding Section 19.68 to the municipal code entitled "Performance Standards and Noise Control". In "Noise Sensitive Zones," the City standards are much more stringent for noise generating sources than the land use siting guidelines in the Noise Element of the General Plan.

The City of Chula Vista exterior noise limits are as follows:

| | **Noise Level dB(A)** | |
|---|---|---|
| Receiving Land Use Category | 10 p.m. - 7 a.m. | 7 a.m. - 10 p.m. |
| All residential except MFU | 45 | 55 |
| Multiple Family Residential | 50 | 60 |
| Commercial | 60 | 65 |
| Light Industry | 70 | 70 |
| Heavy Industry | 80 | 80 |

If the ambient level already exceeds any of these standards, the allowable level is equal to the ambient.

City standards distinguish between "environmental noise" versus "nuisance noise". Environmental noise results from land use activities normally permitted under the land use code. Nuisance noise is considered to be an unusual presence that is "annoying, obnoxious and unpleasant". The above standards are for one-hour averages (LEQ) if the noise is environmental, but never to be exceeded (Lmax) if the source is a nuisance source.

Because a portion of the receiving property near the proposed project site is within City of San Diego city limits, their noise ordinance should also be considered. San Diego's standards for maximally noise-sensitive land uses are even more stringent, seen as follows:

| | Noise Level (1-Hour LEQ in dB) | | |
|---|---|---|---|
| Land Use Zone | 7 AM -7 PM | 7 PM -10 PM | 10 PM - 7 AM |
| R1 | 50 | 45 | 40 |
| R2 | 55 | 50 | 45 |
| R3, R4, other res. | 60 | 55 | 50 |
| Commercial | 65 | 60 | 60 |
| Industrial | 75 | 75 | 75 |

The ordinance makes no allowance for already elevated ambient levels, but does modify its standards if the zoning on the sending and receiving land use are different. The arithmetic average becomes the performance standard for dissimilarly zoned uses.

Existing noise levels at the amphitheater and its surrounding environs derive from a variety of sources. Vehicular traffic on Otay Valley Road, including trucks from aggregate operations, auto dismantling yards and other industrial uses, are most noticeable. Other sources observed during site visits included considerable helicopter activity, especially by the INS. Brown Field light aircraft usually take off westward toward the project site. Intermittent gunfire at the skeet range, industrial equipment such as back-up alarms and farm tractors were observed. The most common noise characteristic of the project vicinity is that it is normally quiet such that individual noise events seem more perceptible. Their cumulative contribution to the overall ambient noise level is therefore limited even if they are readily noticeable.

A test of project-area background noise testing was conducted on the evening of April 13, 1995. The test was repeated on May 1, 1995 to evaluate inter-day (night) differences. A fire on May 1 precluded revisiting one of the earlier measurement sites. The results of the measurements are summarized in Table 1 for the monitoring sites shown in Figure 3.

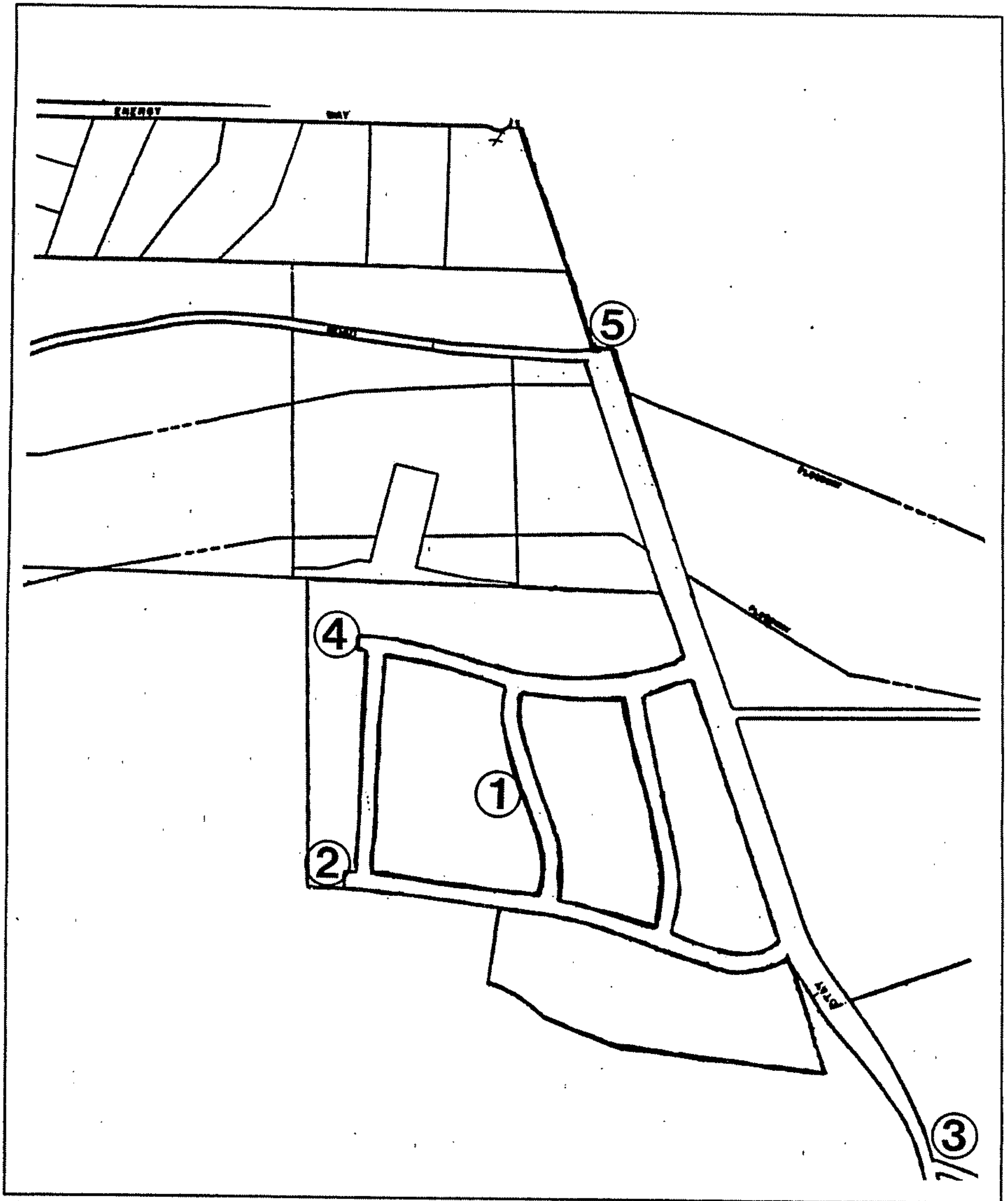
Except for minor sources of noise contamination, mainly close to Otay Valley Road, noise levels were very low. Background levels from mid- to late-evening, as defined by the L50 level (one-half the readings higher, one-half lower), are seen to range from 39-44 dB. Background LEQs ranged from 41-50 dB because single event

## TABLE 1

## PROJECT VICINITY NOISE MONITORING SUMMARY
(Short-term readings in units of dBA)

| Location/Date | | Leq | LMax | LMin | L10 | L33 | L50 | L90 |
|---|---|---|---|---|---|---|---|---|
| Site #1 | | | | | | | | |
| 04/13/95 | 2053-2123 | 43.6 | 64.0 | 40.0 | 44.0 | 43.5 | 43.0 | 41.0 |
| 05/01/95 | 2011-2039 | 44.6 | 64.0 | 38.0 | 40.5 | 39.0 | 39.0 | 38.5 |
| Site #2 | | | | | | | | |
| 04/13/95 | 2136-2206 | 47.9 | 73.0 | 40.0 | 45.5 | 43.5 | 42.5 | 41.0 |
| 05/01/95 | 2052-2122 | 48.6 | 66.5 | 38.5 | 50.5 | 48.0 | 44.0 | 39.5 |
| Site #3 | | | | | | | | |
| 04/13/95 | 2219-2249 | 46.6 | 69.0 | 40.0 | 44.5 | 42.5 | 42.0 | 41.5 |
| 05/01/95 | 2232-2302 | 44.4 | 69.0 | 38.5 | 41.5 | 39.5 | 39.0 | 38.5 |
| Site #4 | | | | | | | | |
| 05/01/95 | 2136-2206 | 41.3 | 59.0 | 38.0 | 40.5 | 39.5 | 39.0 | 38.5 |
| Site #5 | | | | | | | | |
| 04/13/95 | 2300-2330 | 49.5 | 68.0 | 39.0 | 46.0 | 42.0 | 41.0 | 39.5 |

Source: LDL Model 700 Integrating Noise Dosimeter.




BACKGROUND NOISE TESTING LOCATIONS
04/13 AND 05/01/95

FIGURE
3

"spikes" raised the integrated average. The general conclusion from these measurements is that the proposed site is a good choice for an amphitheater because background levels are so low. Conversely, because background levels are low, future planned noise-sensitive development may be annoyed by even low levels of concert noise since there are no masking effects from ambient noise levels.

## NOISE IMPACTS

Three types of noise impacts are expected to possibly occur from project implementation. These include:

1. Temporary construction activity noise impacts. The primary concern is for noise-sensitive avian habitats along the Otay River where construction equipment noise may interfere with bird vocalization during nesting/breeding season.

2. Concert activity noise impacts from amplified music or voice. The low development density of the project vicinity minimizes existing impact potential. The proposed project may, however, cause standards to be exceeded at future development closer to the amphitheater site.

3. Site access traffic noise, especially those associated with late evening departures encompassing heavy traffic volumes during a noise-sensitive time period.

### Standards of Significance

A project will have a potentially significant noise impact if it substantially increases the noise levels near the site. A "substantial increase" is not defined in any guidelines with any uniformity. For purposes of this CEQA analysis, a substantial increase is defined as:

1. An increase that creates a potential violation of noise standards where standards are currently met, or,

2. An increase of a level equal to the baseline conditions if the baseline already exceeds standards.

Noise levels may also create a nuisance independent of any violation of standards. Based upon MCA's acoustical consulting firms's (WJHW) experience in other amphitheater projects, nuisance perception of amphitheater noise increases noticeably around 50 dB. This level has been used to define a significant nuisance threshold.

The City of Chula Vista has no significance criteria for impacts on avian species. However, both the County and City of San Diego utilize a standard of 60 dB LEQ for gnatcatcher or vireo habitat impacts and this standard has been accepted by wildlife management agencies. A level of 60 dB LEQ is therefore an additional significance threshold used for construction activity impacts relative to nearby avian habitats.

**Construction Noise Impacts**

Temporary construction noise impacts from land use development vary markedly because the noise strength of construction equipment ranges widely as a function of the equipment used and its activity level. Short-term construction noise impacts tend to occur in discrete phases dominated initially by large earth-moving sources, then by foundation and parking lot construction, and finally for finish construction. The large earth-moving sources are the noisiest with equipment noise typically ranging from 75 to 90 dB at 50 feet from the source. Figure 4 shows the typical noise emissions associated with specific construction equipment.

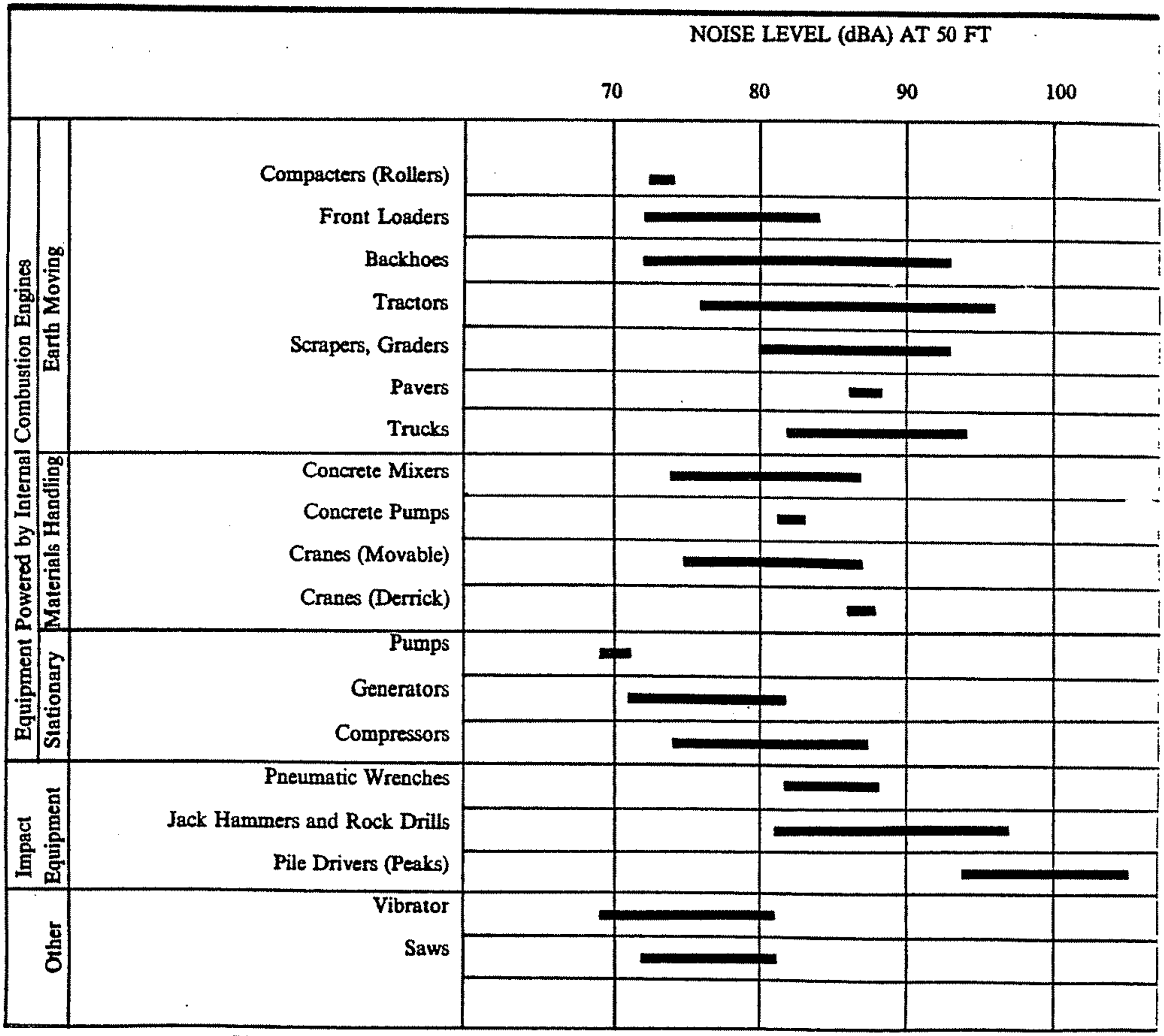
Point sources of noise emissions are atmospherically attenuated by a factor of 6 dB per doubling of distance through geometrical spreading. The quieter noise sources will, thus, drop to a 60 dB noise level by about 400 feet from the source while the loudest could require over 1000 feet from the source to reduce the 90+ dB source strength to a 60 dB level considered as unobtrusive into river bottom bird habitats northeast of the site. The theoretical distance of the 60 dB contour from a single loud piece of construction equipment under direct line of sight conditions is around 1,300 feet. For a direct line sight, the riparian habitat area at 2,600 feet from the amphitheater would have an equipment noise level of around 53 dB (6 dB doubling loss + 1 dB absorption loss). This is well below the significance threshold, even if several pieces of equipment were operating simultaneously.

During project construction, breaks in the direct line of sight from source to receiver will be created by the natural elevation difference between the riparian habitat and the amphitheater site. The break will be enhanced by the berm to be constructed around the parking perimeter and the bowl to be constructed to accommodate the seating facing the stage. Noise level reductions from breaks in the line of sight range from near 10 dB for smaller barriers to 20+ dB for large intervening earthen berms. During minor grading of the parking lot, riparian habitat equipment noise will be near 45 dB. During more intensive excavation of the amphitheater bowl, the habitat noise exposure will be in the mid-30 dB range, or essentially inaudible. Avian habitat noise impacts during construction are therefore less than significant.

Construction noise sources are not strictly relatable to a community noise standard because they occur only during selected times and the source strength varies sharply with time. The penalty associated with noise disturbance during quiet hours and the nuisance factor accompanying such disturbance usually leads to time limits on construction activities imposed as conditions on construction and use permits. Although construction noise is

FIGURE 4

## TYPICAL CONSTRUCTION EQUIPMENT NOISE GENERATION LEVELS




Source: EPA PB 206717, Environmental Protection Agency, Dec. 31, 1971, "Noise from Construction Equipment & Operations" specifically exempt from the noise standards in the municipal noise ordinance, grading/construction permits are generally conditioned by city staff to allow heavy equipment operations only during hours of lesser sensitivity. Weekday hours are typically the allowed times for construction activities if there are occupied dwellings within a reasonable exposure zone surrounding the construction site. Given the distance and topography between the project site and off-site sensitive receivers, construction activities will have a less than significant noise impact when conditioned to operate during less noise-sensitive hours.

**Concert Activity Noise Impacts**

Amphitheaters and noise-sensitive land uses may have a noise conflict because loudness is an important factor in auditory response. The conflict can occur in either direction. Quiet movements in a symphony can be destroyed by airplanes, helicopters, sirens, car horns, trucks, etc. Similarly, the ability to sleep with one's windows open can be completely eliminated by nearby amplified music. Volume seems particularly critical to contemporary music where music is not real music until it approaches hearing loss thresholds. Concert attendees and adjacent residential uses may thus have completely different reactions to the volume of noise generated by performance versus the background level.

In a perfect world, venues for outdoor music presentation would be built without an already noisy environment to degrade appreciation, and without nearby receivers that would complain about the volume of noise generated. Unfortunately, both objectives have to sometimes be compromised in the rear world. This compromise involves siting a facility far enough way, or acoustically isolated from, noise-sensitive land uses, but also not so far as to make venue access prohibitive. New candidate amphitheater facilities are therefore topographically isolated, or so surrounded by lesser sensitivity land uses, as to accommodate both the objectives of the attendee and the adjacent receiver.

In order to evaluate these competing concerns, MCA concerts and Starboard Development Corp. commissioned a comprehensive acoustical study of the amphitheater project. This study simulated future noise exposure by playing rock-and-roll music through a large stack of speakers at the future stage location, and then measuring the noise levels at various locations in various directions from the facility. Two set of measurements were made prompted by a proposed eastward relocation of the amphitheater from its original site. The simulation may not have been perfect in that:

1. The bowl has not been dug that will deflect some sound upward,

2. The second test was done in the daytime when the meteorology that affects sound transmission may be different, and,

3. There were no spectators that absorb some sound energy, but generate their own noise.

However, it was felt by the acoustical consultant that actual measurements are more reliable than computer modeling of sound transmission because the interaction of sound waves with complex terrain is very difficult to simulate accurately.

Figure 5 shows the various noise monitoring locations, and Table 2 shows the concert noise level at each measurement location where concert noise was audible. Figure 6 shows the results of the WJHW Noise Impact Evaluation (1995). The conclusions/recommendations of their study were as follows:

- Existing Chula Vista residences meet the City of Chula Vista noise standard.

- Potential future noise-sensitive uses will exceed the Chula Vista or City of San Diego standard, especially after 10 p.m. By the criteria established previously, this would constitute a potentially significant noise impact.

The study makes the following recommendations:

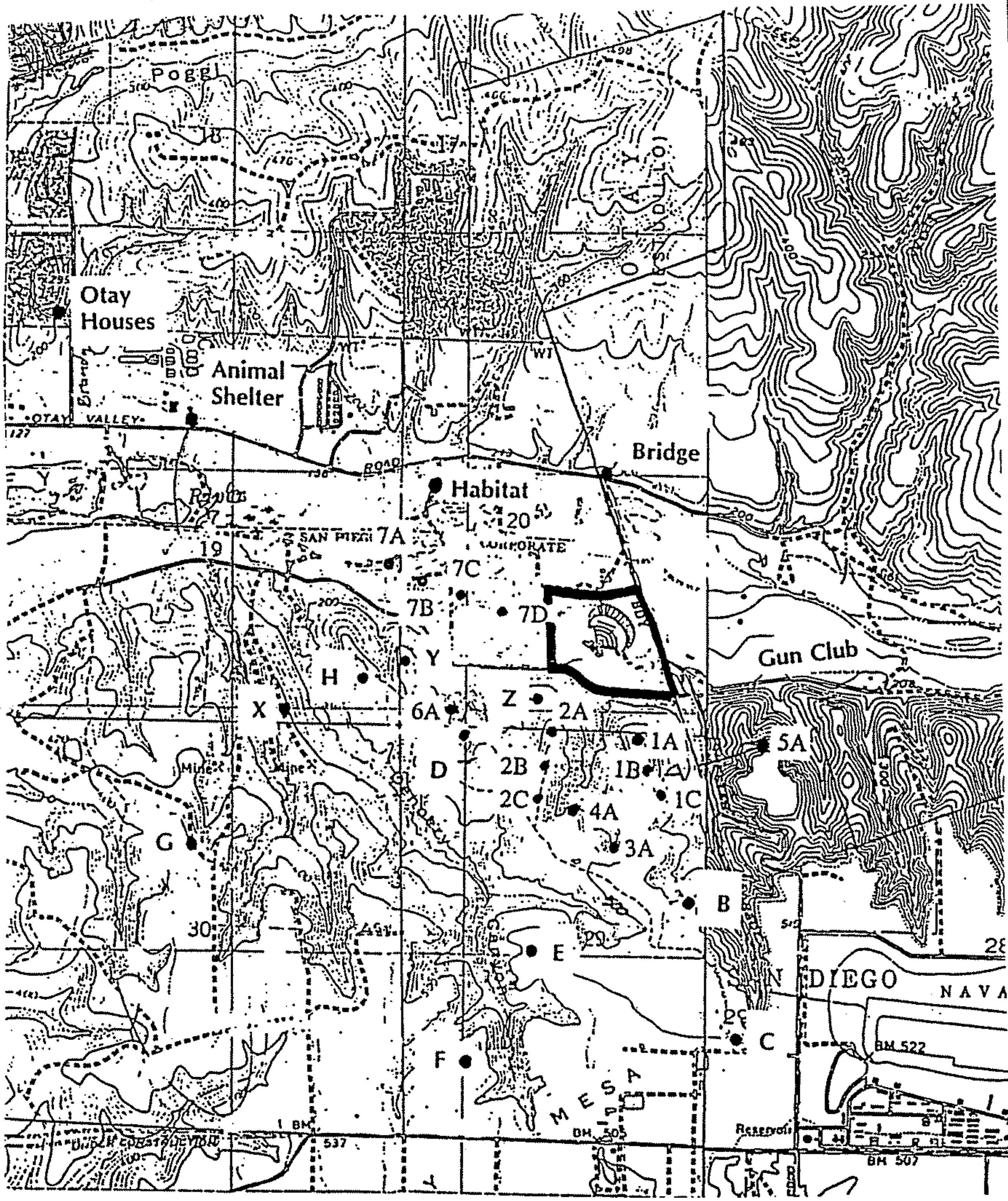
1. Classify the amphitheater as an environmental source instead of a nuisance source to allow the standard to be the average instead of the short-term maximum.

2. Reset the standard for allowable noise for amphitheater use to 50 dB LEQ and modify the hours of the nocturnal noise standard to start at 11:30 p.m. instead of 10 p.m. through a variance from the ordinance.

3. Rezone all property within the 50 dB LEQ contour in Figure 6 to non-residential.

The report acknowledges that some complaints are possible if the 50 dB standard is applied by variance to this source.

Each of the recommendations above is designed to bring the project within ordinance compliance. It does not alter the CEQA




CONCERT NOISE SIMULATION
MONITORING LOCATIONS

FIGURE
5

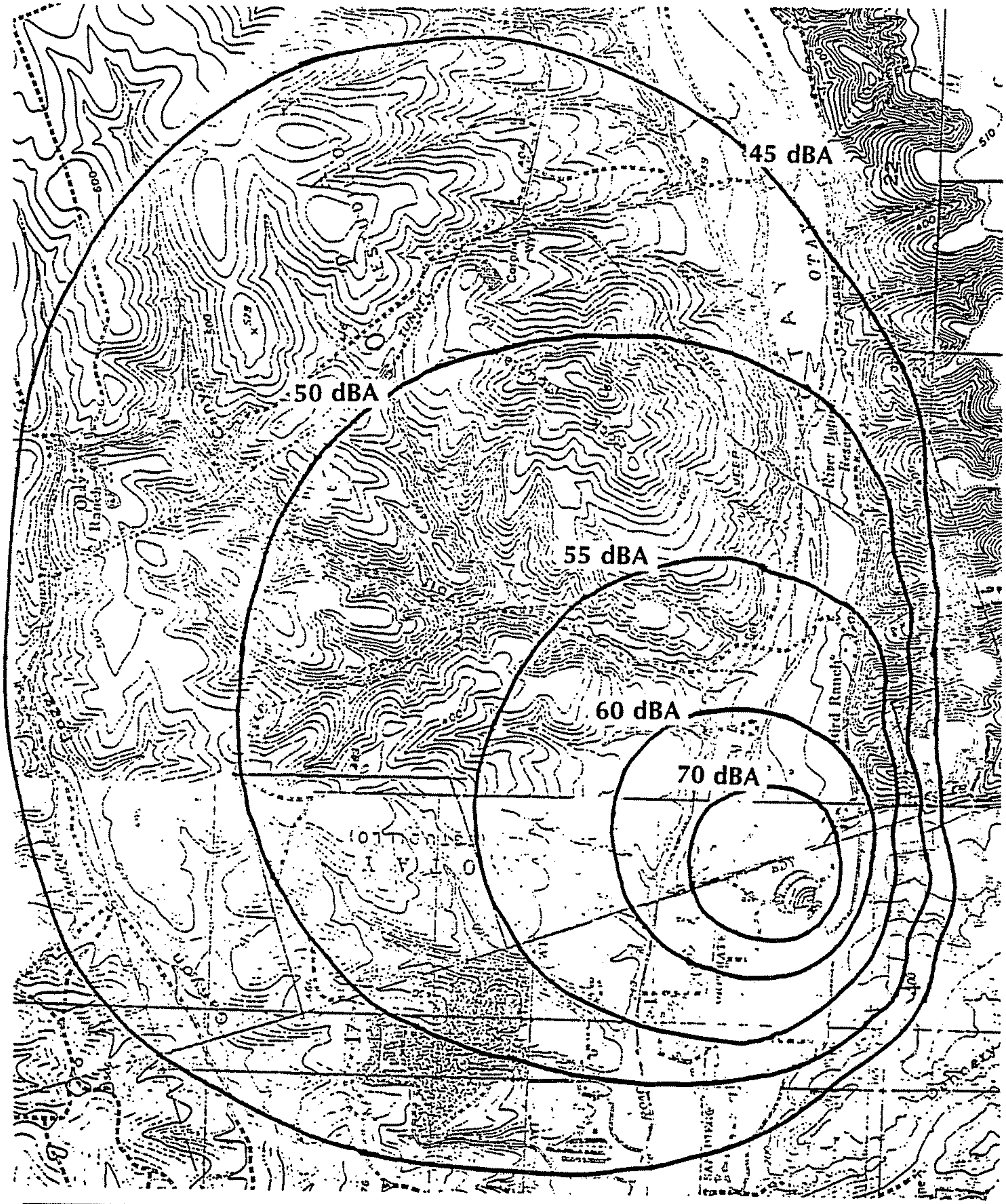



FIGURE 6

AMPHITHEATER NOISE IMPACT CONTOURS

**APPENDIX C**

**NOISE**

# TABLE 2

## CONCERT NOISE SIMULATION STUDY RESULTS

| Location | 07/24/94 Noise Level Avg. | 07/24/94 Noise Level Peak | Location | 04/17/95 Noise Level |
|---|---|---|---|---|
| Mix Position | 105 | 105 | Reference | 95 |
| 200' behind speakers | 68 | 68 | 1A | 60 |
| B | N/A | N/A | 1B | 45 |
| C | N/A | N/A | 2A | 60 |
| D | 57 | 62 | 2B | 47 |
| E | N/A | N/A | 2C | 37 |
| F | N/A | N/A | 3A | 45 |
| G | 43 | N/A | 4A | 47 |
| H | 67 | 68 | 5A | N/A |
| X | 52 | 56 | 6A | 45 |
| Y | 58 | 62 | 7A | N/A |
| Z | 66 | 68 | 7B | N/A |
| Houses | <49 | N/A | 7C | 53 |
| Animal Shelter | <49 | N/A | 7D | 55 |
| VOR | 41 | 45 | | |
| Gun Club | 61 | 70 | | |
| Bridge | 66 | 74 | | |
| Bird Habitat | 53 | N/A | | |

Source: WJHW Report No. 94049-01, April 21, 1995

N/A = not audible

significance criterion because noise will be substantially increased and a non-negligible number of people will perceive the amphitheater to be a nuisance in the future. Probable violations of existing standards within Chula Vista and/or San Diego are therefore a sufficient basis for finding that the project will have a significant noise impact even if the inability to meet the existing ordinance limit is remedied by variance from the ordinance limits. Recommendations to rezone property to create a less noise-sensitive land use designation may also constitute a "take" that could have legal and/or economic implications.

**Traffic Noise Impacts**

The combination of a daytime swap meet and major evening concerts may add as many as 15,320 daily trips to the area street system. Of these trips, 85 percent are forecast to use Otay Valley Road in the near term. Given that only 3,000 vehicles use Otay Valley Road each day east of Nirvana Ave., the project contribution is substantial. The project traffic study concludes that there is adequate capacity to accommodate project traffic without any adverse congestion effects. However, the dramatic increase in average daily traffic (ADT) will clearly affect the noise environment near Otay Valley Road.

The noise impact potential is exacerbated by the fact that most concert traffic will occur in the evening when the CNEL metric adds 5 dB to all traffic noise from 7 p.m. to 10 p.m., and 10 dB to all noise after 10 p.m. Every vehicle from 7 p.m. to 10 p.m. counts as 3 effective vehicles, and every vehicle from 10 p.m. to 7 a.m. counts as 10 vehicles. The traffic volume of 15,320 ADT associated with the project effectively counts as 80,000 ADT when the time-weighting penalty is applied to 30+ percent of project traffic from 7 to 10 p.m., and almost 40 percent which will occur after 10 p.m.

Traffic noise was calculated at two locations along Otay Valley Road where baseline ADT had been developed by the project traffic consultant. The Federal Highway Traffic Noise Prediction Model (FHWA-RD-77-108) with the California Vehicle Noise (CALVENO) modification was used for this analysis. Traffic noise levels for the no-project baseline were predicted, and the project impact was then superimposed upon the baseline. Table 3 shows the results of these calculations.

A change in ambient noise levels of 3 dB is the generally accepted threshold of a perceptible change in noise levels. A 10 dB increase is perceived to be twice as loud as before. For near-term conditions, traffic noise level increases will be perceptible near

# TABLE 3

## TRAFFIC NOISE IMPACT ANALYSIS

## (CNEL @ 100' to Otay Valley Road centerline)

| I-805 to Oleander Ave.* | Background | w/Proj. | Impact |
|---|---|---|---|
| Opening Day | 64.9 | 68.6 | + 3.7 |
| 2010 Interim | 67.5 | 69.9 | + 2.4 |
| Buildout | 70.4 | 71.2 | + 0.8 |
| **Brandywine Ave. to Nirvana Ave.** | | | |
| Opening Day | 57.0 | 67.5 | +10.5 |
| 2010 Interim | 68.0 | 70.2 | + 2.2 |
| Buildout | 70.3 | 71.1 | + 0.8 |

Source: FHWA-RD-77-108 (Calveno mod.)

* - without I-805 background noise.

I-805, and twice as loud as without the project farther east along Otay Valley Road. As baseline traffic volumes increase, and other directional travel opportunities are developed along new area roadways, the project-related traffic noise impact will be masked by the rising baseline and diffused by the use of multiple access/ egress roadways. At buildout, the project contribution of less than 1 dB to the total noise exposure will be indistinguishable from the background.

Existing noise-sensitive land uses, except possibly for biotic species along the river or in coastal sage scrub habitat in the hills above Otay Valley Road, occur only in close proximity to I-805 (north of Otay Valley Road, west of Oleander). The freeway background noise will mask most changes in traffic noise from Otay Valley Road. The noise level increase shown in Table 3 for the Otay Valley Road link from I-805 to Oleander will be less than the 3.7 dB change attributed to project site traffic. Unless the concert departure crowd is particularly boisterous (vehicle boom boxes, honking horns, screeching tires, shouting from vehicle to vehicle), the closest residents to Otay Valley Road will likely not be aware of any noticeable change in traffic noise associated with concert departure. Thus, while the noise level increase would be substantial during early project years, the lack of a sensitive population potentially affected by the project makes this potential impact less than significant.

## MITIGATION/MITIGATION MONITORING

Construction noise impacts are considered less than significant. Vehicular access/egress noise during early project years will be clearly audible, but there are no noise-sensitive residences near Otay Valley Road that do not already experience freeway traffic noise masking. The traffic noise impact is considered adverse, but less than significant.

Concert performance noise will exceed threshold levels established in the City of Chula Vista and City of San Diego municipal noise ordinances. A variance on threshold levels and on time of allowable exposure will need to be granted by the City of Chula Vista. By establishing a higher permissible threshold, noise complaints from a limited number of future area residents are anticipated. This impact is considered significant and non-mitigable. Because the precise degree of excess noise exposure can not be reliably quantified until the facility is actually constructed, an event noise monitoring program (ENMP) is recommended to quantify noise exposure and to suggest additional noise reduction techniques to reduce potential future noise conflicts when residential uses are ultimately developed in the project vicinity.

### Mitigation Measures

1. The facility will be operated in a manner to comply with the conditions on the variance to the City of Chula Vista noise ordinance.

2. Time limits on the termination of any amplified sound will be established as part of the use permit.

3. An ENMP shall be conducted by an independent acoustical consulting firm monitoring reference noise levels within the amphitheater correlated to observed noise levels in the surrounding community.

4. If noise impacts in the areas of future noise-sensitive use are judged as a possible nuisance, additional noise control features shall be evaluated and tested. Such measures might include:

   a. additional vertical barriers above the top of the grass area seating berm,

   b. limits on amplifier power if the reference noise level at the mixing booth exceeds a specified threshold,

c. modified speaker designs that better focus sound energy and reduce side lobe energy losses,

d. noise cancellation techniques using separate out-of-phase speakers outside the amphitheater.

5. Use permit conditions relative to noise shall be reviewed periodically to verify that the amphitheater is being operated in a way that best minimizes noise nuisance potential.

# NOTE

**The following technical report was submitted to the City of Chula Vista by the project applicant. Data from this report has been independently verified and analyzed by a consultant under contract to the City. The conclusions reached in this report in some cases are not consistent with the City's interpretation of the data. Please refer to Section 3.3 of the EIR for the City's independent analysis of project noise impacts.**

# ENVIRONMENTAL NOISE IMPACT EVALUATION
# CHULA VISTA AMPHITHEATER SITE
# CHULA VISTA, CALIFORNIA

WJHW Report Number 94049-01

April 21, 1995

Prepared for:

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# LIST OF SYMBOLS

| SYMBOL | DEFINITION |
|---|---|
| $L$ | Sound Pressure Level (SPL) |
| $L_{EQ}$ | Average or Equivalent Sound Level |
| $L_{DN}$ | Average or Equivalent Day-Night Sound Level |
| dB | Unweighted Decibel |
| dBA | A-Weighted Decibel |

# 1 SUMMARY OF FINDINGS

It is our judgment that, from the standpoint of noise impact on the existing housing, the proposed site is suitable for development of an amphitheater facility. No existing residential areas are expected to be impacted by amphitheater operations. However, there are several options which need to be addressed if the development of the facility is to proceed.

We highly recommend that future residential development should be avoided within the 50 dBA contour line. This applies to land use in both the City of Chula Vista and the City of San Diego.

The San Diego noise ordinance limits sound levels to 40 dBA (R-1 zoned) and 45 dBA (R-2 zoned) after 10:00 P.M. It is likely that residential development on the mesa due south of the proposed amphitheater will be exposed to levels in excess of 40 dBA. Our experience has shown that there is little adverse impact from amphitheater noise at levels of 50 dBA and below. The 50 dBA criteria is based on normal suburban ambient noise levels and the annoyance threshold of most individuals within a community. We recommend discussions with the City of San Diego to review this situation.

## 2 INTRODUCTION

This technical report summarizes the efforts undertaken to provide an environmental noise impact assessment of the proposed Chula Vista Amphitheater site. Wrightson, Johnson, Haddon & Williams, Inc. (WJHW) was retained by MCA Concerts and Starboard for the assessment of the site between the dates of March 1994 and April 1995. The goals of the study were as follows:

1. Provide a technical and psychoacoustic assessment for the site. Predict conformance of the facility at the proposed location with existing local noise ordinances. Predict whether or not complaints can be expected from the surrounding residential neighborhoods.
2. Provide a predicted noise propagation model based on the proposed facility design. The prediction model was based on previous WJHW evaluations and measurements made with regard to the design of similar facilities in North America.
3. Recommend the most favored location and orientation of the facility on the site, based on the predicted noise propagation model, so as to minimize the environmental noise impact on the surrounding community. The recommended location and orientation was heavily dependent on a visual evaluation of the site by WJHW personnel and an in-situ sound test.
4. Conduct an on-site noise test to better quantify the proposed facility's impact on the surrounding residential areas. The evaluation of this test forms the basis of the final conclusions and recommendations.

# 3 BACKGROUND INFORMATION

## 3.1 Site Description

The proposed amphitheater site, although it is solely within the city of Chula Vista, is located in a developed tract of land which lies on the border of the cities of Chula Vista and San Diego in the Otay Valley. Figure 3.1.1 provides some detail for the proposed site.

The site is characterized by rapid elevation changes to both the north and the south of the Otay Valley. The proposed site is approximately near the valley floor. This terrain aids in the reduction of sound propagation to the north and the south, as potential future residential locations without line of sight to the facility will have increased sound attenuation over those locations located an equivalent distance away over flat ground. The impact on elevated areas which have a direct line of sight to the proposed facility will be greater given the fact that normal noise control construction techniques will yield little or no added sound attenuation. Any residential areas which may be built on the hills overlooking the proposed facility will have a clear line of sight to the amphitheater. The utilization of sound control walls will have little effect for the residential housing located in these areas.

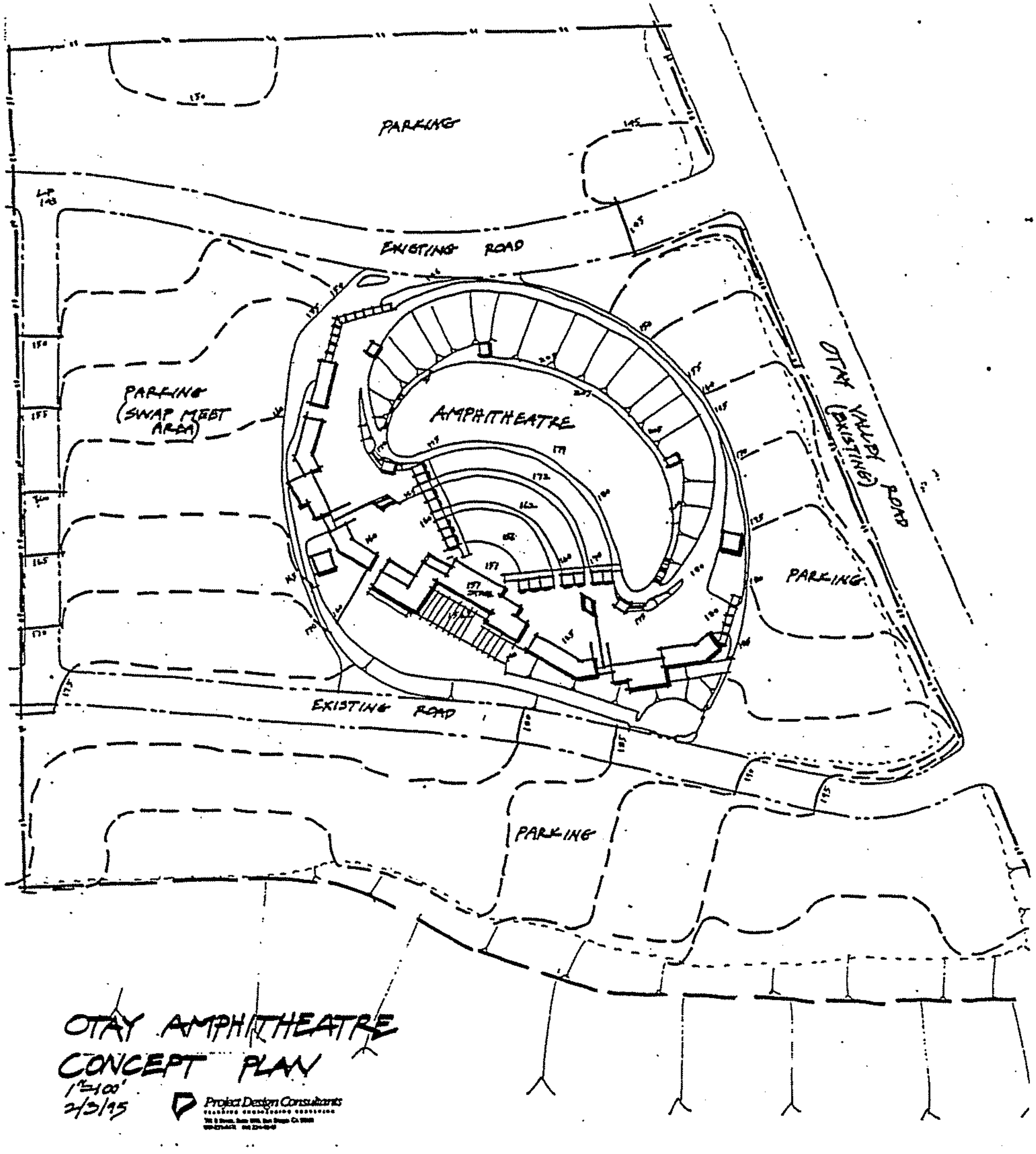


**FIGURE 3.1.1** *Proposed Amphitheater Concept Plan*
*Scale: 1 inch = 275 feet*

## 3.2 Existing and Future Residential Areas

Residential neighborhoods currently exist only to the west of the site, north of Otay Valley Road. It is our understanding that the ridge top to the immediate south of the site, along the edge of the valley and the Otay Mesa is zoned residential. At this time, only industrial land uses are found in this area. It appears that considerable infrastructure (i.e. roads, utilities, etc.) would need to be in place prior to any substantial residential development in this area. The potential also exists for future residential development as part of a planned community to the north east of the site. We have assumed that a resident employee of the nearby gun club will not be considered as a permanent resident. In addition, we do not claim to have made a formal survey of the entire valley area to identify any and all existing housing.

## 3.3 Environmental Noise Criteria

### 3.3.1 General

The typical metric utilized in measuring environmental noise levels are A-weighted sound pressure levels (dBA). It is the metric of choice for most federal agencies (i.e. HUD, EPA, FAA, VA, etc.) and also most state and local noise regulations. The A-weighted sound pressure level has been adopted as an adequate descriptor of environmental noise since it, in part, approximates the frequency sensitivity of average human hearing. The A-weighting filter network, which is employed in a sound level meter, de-emphasizes the low and high frequency portions of the noise spectrum in order to simulate the human ear's response. Table 3.3.1.1 details the frequency dependent relative response of the A-weighted filter. In addition, numerous studies have shown that there is a good correlation between the subjective response of people and communities to noise and A-weighted noise measurements. Table 3.3.1.2 compares typical A-weighted sound pressure levels for several common noise sources.

Measurement of ambient noise levels is also another important consideration in the environmental noise. The ambient noise level is an indication of the noise heard in an area due to noise sources both near and far emanating from normal activities. The ambient noise level is an important factor in that it can often indicate the subjective perceptibility of noise. In areas where ambient noise levels are relatively high, such as near a busy street, the ambient noise levels can mask or obscure the perception of individual noises. Conversely, in very quiet areas, faint sounds can often be clearly identified even though the loudness of the noise source is relatively low. This is particularly evident when the spectral characteristics of the noise source and the background are different.

At any given location, environmental noise levels tends to vary. Consequently, several noise measurement metrics have been developed in order to attach single number metrics that attempt to describe the noise level present at a given location even though the measurement at any given instant of time is different from another time.

In order to compensate for fluctuating noise levels, an equivalent noise level ($L_{EQ}$) is often computed. $L_{EQ}$ is a computed energy average found by integrating sound levels (again typically A-weighted for environmental noise) over a given time period.

A commonly utilized metric for environmental noise is the day-night sound level ($L_{DN}$). $L_{DN}$ is an annualized equivalent sound level computed by integrating A-weighted sound levels over a 24 hour per day period, with a 10 dBA penalty added to the average nighttime noise level ($L_{EQN}$). The nighttime period is defined between the hours of 10:00 P.M. and 7:00 A.M. In order to obtain the annualized $L_{DN}$, the daily $L_{DN}$'s are integrated over an entire year.

**TABLE 3.3.1.1** *A-Weighted Filter Relative Response Characteristics*

| *Frequency (Hz)* | *A-Weighted Relative Response (dB)* |
|---|---|
| 10 | -70.4 |
| 12.5 | -63.4 |
| 16 | -56.7 |
| 20 | -50.5 |
| 25 | -44.7 |
| 31.5 | -39.4 |
| 40 | -34.6 |
| 50 | -30.2 |
| 63 | -26.2 |
| 80 | -22.5 |
| 100 | -19.1 |
| 125 | -16.1 |
| 160 | -13.4 |
| 200 | -10.9 |
| 250 | -8.6 |
| 315 | -6.6 |
| 400 | -4.8 |
| 500 | -3.2 |
| 630 | -1.9 |
| 800 | -0.8 |
| 1k | 0 |
| 1.25k | +0.6 |
| 1.6k | +1.0 |
| 2k | +1.2 |
| 2.5k | +1.3 |
| 3.15k | +1.2 |
| 4k | +1.0 |
| 5k | +0.5 |
| 6.3k | -0.1 |
| 8k | -1.1 |
| 10k | -2.5 |
| 12.5k | -4.3 |
| 16k | -6.6 |
| 20k | -9.3 |

**TABLE 3.3.1.2** *Reference A-Weighted Sound Pressure Levels*

| *Application* | *Typical Noise Level (dBA)* |
|---|---|
| Threshold of Pain | 140 |
| Threshold of Feeling | 130 |
| Riveting on Large Steel Plate at 6 feet | 120 |
| Chain Saw (at operator's ear) | 110 |
| Pneumatic Hammer (at operator's ear) | 100 |
| OSHA 8 Hour Noise Limit | 90 |
| Heavy Truck at 50 feet (50 MPH) | 85 |
| Automobile at 50 feet (50 MPH) | 75 |
| Man's Voice at 3 feet | 65 |
| Typical Living Room Ambient | 40 |
| Recording Studio Ambient | 20 |
| Threshold of Hearing | 0 |

## 3.3.2 Existing Local Noise Criteria

The site under consideration is unusual from a noise standpoint, in that the operation of an amphitheater has the possibility of impacting both the City of San Diego and the City of Chula Vista. While this facility is located fully within the city limits of Chula Vista and hence, is subject to its noise ordinances, the possibility exists for claims to be made against the facility and the City of Chula Vista. The complaints may emanate from either San Diego residents or by the City of San Diego itself.

The City of Chula Vista, in Ordinance number 2101 (1985), provides for control over noise with both objective and subjective criteria. The criteria are further defined under two categories; Environmental Noise and Nuisance Noise. The definition of Nuisance Noise includes "...sound amplifiers, musical instruments and drums." Nuisance Noise is considered to be a disturbance if "...their unusual presence are considered harmful to health and well-being, annoying, obnoxious and unpleasant." Environmental Noise is defined as "...disturbances resulting from land use activity normally permitted under the land use code, but which exceed the noise level limits set by this code for that particular land use." The ordinance allows any noise offense to be categorized and enforced as both Environmental and Nuisance Noise. Any determination as to the nature of the noise and the applicable standard is to be made by the Chief of Police.

The objective standards cite a one hour average noise limit for Environmental Noise and "not to exceed maximum noise levels" for Nuisance Noise. Noise measurements are to be conducted at the property line of the receiving land use. Exterior noise limits for single family residential dwellings are restricted to a one hour average ($L_{EQ}$) noise level of 45 dBA between the hours of 10:00 P.M. and 7:00 A.M., with Nuisance Noise never allowed to exceed 45 dBA during the same nighttime period. Nighttime noise levels for multiple dwelling residential zoning is limited to 50 dBA for both Environmental and Nuisance Noise.

The City of San Diego has a similarly strict noise ordinance. Division 4 of the San Diego Municipal Code (59.5.0403) limits noise limits for all R-1 zoned residential land uses to on hour average ($L_{EQ}$) measurements of 45 dBA between the evening hours of 7:00 P.M. and 10:00 P.M. The noise limit is lowered to an $L_{EQ}$ of 40 dBA for the nighttime period of 10:00 P.M. to 7:00 A.M. This is a very difficult standard for even typical suburban noise to conform to as elements such as air conditioning compressors of adjacent dwellings may easily exceed the 40 dBA limit.

### 3.3.3 Previous Experience

Wrightson, Johnson, Haddon & Williams has had significant experience with community noise intrusion from outdoor music venues around North America. Our experience indicates that 50 dBA can be considered as the maximum noise level due to amphitheater operations which is "acceptable" from a community response standpoint. It has also been our experience that even when amphitheater noise is just faintly audible *outdoors*, and although it may be at or near the typical background noise levels caused by normal activities and also conform to local noise criteria, the operator and the city can expect to elicit complaints from a small percentage of residents in the nearby residential neighborhoods. Many complaints can arise from residents more out of a dislike for the type of music then the actual noise level at their property. Typically, the frequency and degree of complaints will subside as the amphitheater becomes more of an accepted part of local ambient noise. Also, note that the quieter the ambient is, the higher the expected number of complaints will be. This is due, in part, to the fact that the perceptibility of the signal is greater. It is our experience that this level of complaint activity can be addressed, mitigated and managed with a joint effort between facility management and city staff.

# 4 NOISE MEASUREMENTS

This section provides detail on the two separate noise tests that were conducted on the site. An original noise test was performed at the site during the evening of July 24, 1994. A second noise propagation test was conducted on Monday afternoon, April 17, 1995 to determine the expected noise impact on certain areas that were not covered during the initial test.

## 4.1 Test Description and Procedure

Wrightson, Johnson, Haddon & Williams, Inc. has established and standardized a noise testing protocol over the past several years at various proposed amphitheater locations around North America. Essentially, a full concert sound system is assembled on site and operated at a noise level which is consistent with typical ~~rock and~~ popular music shows. The sound pressure level is typically in the range of 105-110 dBA at a distance of 100 feet from the loudspeaker stacks.

Although WJHW has extensive field measurements of noise from several amphitheaters and can project this data to new sites as well as calculate estimates, we cannot accurately predict the propagation of sound outdoors in location where there are a significant number of natural obstacles and paths for the noise. It is also not possible to compile, with currently available technology, an accurate computer model of outdoor sound propagation variations due to local weather conditions. In these cases, an on-site noise test provides a more accurate understanding of sound propagation in the area under similar operating conditions which will be present during concerts and also allows a far more accurate prediction of the expected noise impact on the surrounding residential areas. We have found, in previous tests, that the results of this type of test to be excellent in predicting the audibility of concert noise in areas impacted by an amphitheater.

An original noise test was performed during the evening of July 24, 1994. Several months later, a decision was made to relocate the site one half mile further to the east. A second test, termed the noise propagation test, was performed during the afternoon of April 17, 1995. The noise propagation test was performed to predict the impact the site relocation will have on the areas south and west of the site.

The noise measurements were made at several strategic locations surrounding the site. Figure 4.1.1 shows the measurement locations around the proposed site for both the noise and noise propagation tests. The locations were selected to primarily to gain an understanding of expected amphitheater noise levels at the existing residential areas most likely to be impacted by the development. A direct approach to determining residential noise impact was chosen rather than developing propagation loss data for predictions of noise levels. The latter approach would require literally hundreds of measurement points due to the varying terrain. It is our judgment that collection of this data would not provide better estimates of noise levels at existing housing areas than the simplified option of measuring the noise levels at the selected measurement locations. At each of the respective measurement locations, both the A-weighted ambient noise level and the A-weighted noise level with the sound source on were recorded.

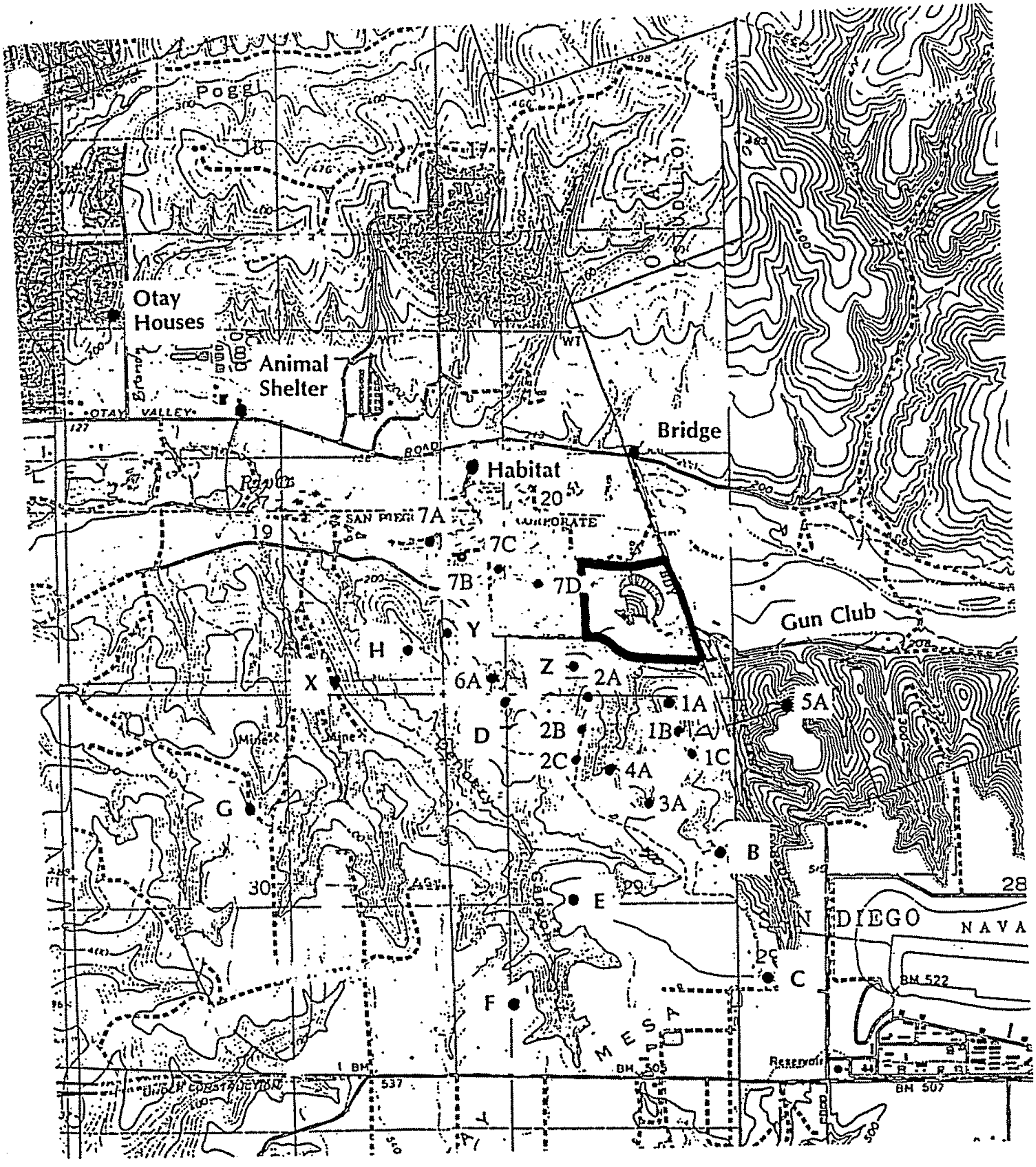


FIGURE 4.1.1 Noise Test and Noise Propagation Test Measurement Locations

## 4.2 Noise Source

In order to simulate concert noise, a touring concert system was set up on the nearest accessible location to the site. The generator powered sound system was provided by Electrotech, a major supplier to the concert industry. The system included eighteen Lab Q mid/high enclosures, eighteen Lab Q single 18 inch woofer enclosures and eight dual 18 inch sub-woofer enclosures. The system can be considered to be representative of a typical amphitheater sound system, with the exception of the stage monitoring system, which was not in use for the test. The system was oriented in order to direct sound toward the same areas as the proposed amphitheater.

The system was operated at a sound pressure level of 105 dBA at a distance of 100 feet from the loudspeaker stacks. The noise source was prerecorded "heavy metal/hard rock". This sound pressure level and distance was selected to be consistent with the mixing console location and levels normally encountered in current amphitheaters. The mix location reference point is important as it represents the location where concert sound engineers subjectively judge the loudness of the music being performed. The majority of loud rock and popular music acts maintain sound pressure levels in the range of 103-106 dBA at the mixing console. The sound pressure levels used for the Chula Vista ~~tests are~~ consistent with standard concert practice and can be considered typical and representative of actual noise levels for most touring acts.

## 4.3 Test Conditions

The set of noise tests were conducted during the afternoon and early evening to provide an approximation of typical conditions during actual performances at the proposed site. The original noise test was run between 4:00 P.M. and 9:00 P.M. Similarly, the noise propagation test began at 10:00 A.M. and had concluded by 1:30 P.M. Concerts can be expected to be staged approximately between 7:00 P.M. and 11:30 P.M. It is our judgment that the afternoon and early evening hours provided us with reasonably accurate test conditions.

The weather conditions were consistent during both tests. The measured air temperatures were around 74 °F and 70°F,respectively, for the noise and noise propagation tests with light on-shore winds present.

## 4.4 Measurement Instrumentation

The acoustical measurement instrumentation used in the measurement and evaluation of the proposed site conform to ANSI Standard S1.4 for Type I (Precision) sound level meters. Type I sound level meters are specified to maintain an accuracy of +/- 1.0 dB throughout the frequency range of interest for this project. The on-site calibration of sound level meters using acoustic calibrators is traceable to the U.S. National Bureau of Standards. Both sound level meters were calibrated before and after the measurement period. The following instrumentation were utilized in the measurement of the site:

| | |
|---|---|
| Rion NA-61 Precision Type I Sound Level Meter | S/N 00510366 |
| Ivie IE-30A Precision Type I Sound Level Meter | S/N 805B473 |
| Bruel & Kjaer Type 4230 Sound Level Calibrator | S/N 431985 |

## 4.5 Results

As discussed previously, noise measurements were taken at several strategic points around the site. Tables 4.5.1 and 4.5.2 present a summary of the noise test results and the noise propagation test results, respectively, at each of the specified measurement locations.

**TABLE 4.5.1** Noise Test Results

| Measurement Location | Average (dBA) | Peak (dBA) |
|---|---|---|
| **Mix Position** | 105 | 105 |
| **200' Behind Loudspeakers** | 68 | 68 |
| **B** | Not Audible | |
| **C** | Not Audible | |
| **D** | 57 | 62 |
| **E** | Not Audible | |
| **F** | Not Audible | |
| **G** | 43 | N/A |
| **H** | 67 | 68 |
| **X** | 52 | 56 |
| **Y** | 58 | 62 |
| **Z** | 66 | 68 |
| **Houses at Otay Valley** | Under 49 | |
| **Animal Shelter** | Under 49 | |
| **Otay Ranch VOR** | 41 | 45 |
| **Gun Club** | 61 | 70 |
| **Bridge at Otay River** | 66 | 74 |
| **Bird Habitat** | 53 | N/A |

Note: Ambient noise levels were typically 41-46 dBA when not influenced by motorcycles and Brown Field aircraft activity.

Sound System provided by Electrotech:

18 Lab Q mid/high enclosures
18 Lab Q single 18" woofer enclosures
8 dual 18" sub-woofer enclosures

**TABLE 4.5.2** Noise Propagation Test Results

| *Measurement Location* | *Distance (feet)* | *Level (dBA)* |
|---|---|---|
| **Reference** | 50 | 95 |
| **1A** | 1,900 | 60 |
| **1B** | 2,200 | 45 |
| **1C** | 2,430 | 39 |
| **2A** | 1,500 | 60 |
| **2B** | 2,030 | 47 |
| **2C** | 2,560 | 37 |
| **3A** | 3,000 | 45* |
| **4A** | 2,550 | 47* |
| **5A** | 3,200 | at Ambient |
| **6A** | 2,400 | 45* |
| **7A** | 2,600 | 45 (at Ambient) |
| **7B** | 2,070 | at Ambient |
| **7C** | 1,540 | 53 |
| **7D** | 1,010 | 55 |

* Denotes direct line of sight to the noise source

## 4.6 Predicted Amphitheater Noise

A copy of the projected noise contours for the facility can be found in Figure 4.6.1. Figure 4.6.2 provides added detail for the $L_{EQ}$ 50 dBA contour. Note that the noise levels shown are estimates of one hour averaged $L_{EQ}$ measurements. The noise level from the amphitheater is expected to range from 45 dBA to inaudible at the nearest existing housing. At these levels, residents in the nearby communities may be expected to hear some concert activity outdoors. We expect that the concerts will not be audible indoors with the windows closed. We foresee that the concert noise levels will be in approximately the same range or lower as the other existing noises in the neighborhoods, mainly due to the proximity to the 805 Freeway.

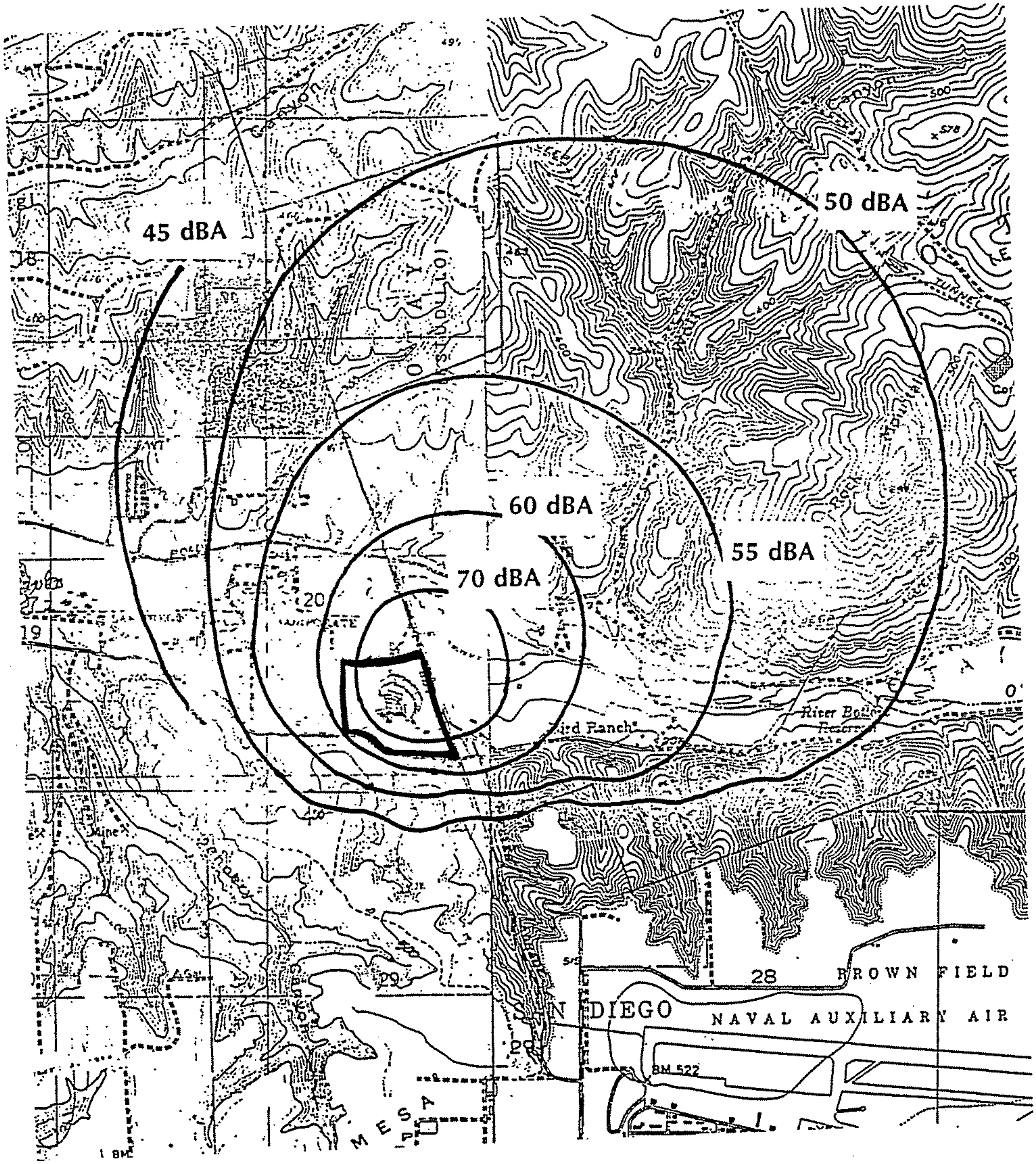


FIGURE 4.6.1 Predicted Amphitheater Noise Contours

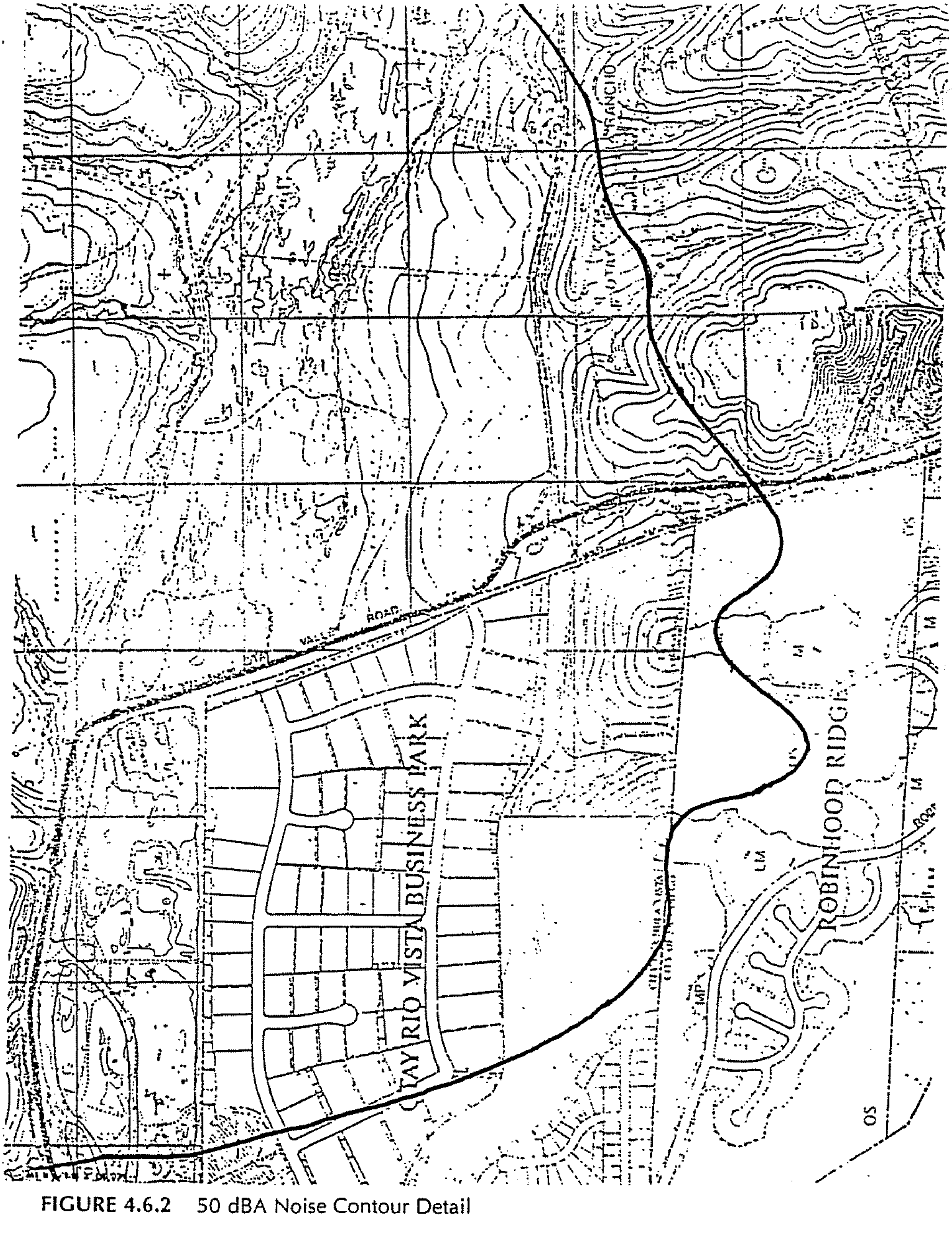


**FIGURE 4.6.2** 50 dBA Noise Contour Detail

# 5 CONCLUSIONS AND RECOMMENDATIONS

The results of the noise test indicate that the proposed site is suitable for the development of an amphitheater facility and that the existing housing will not be adversely impacted. The sound during the noise test was barely audible, indicating that the concert sound was at or below the ambient noise levels, at the existing housing to the northwest and at all proposed developments on the mesa with the exception of Robin Hood Ridge. As would have been expected, sound pressure levels were higher directly on-axis towards the northeast.

As discussed previously, it has been our experience that 50 dBA is the maximum allowable noise level at a residential property line where noise from an amphitheater facility is deemed "acceptable" from a community response standpoint. For most suburban settings, a noise level of 50 dBA will be at or near the ambient noise level in the area. Therefore, under these conditions, concert sound will be barely audible outdoors and inaudible indoors.

We recommend that the City of Chula Vista discourage any residential development inside the 50 dBA contour line. This scenario would involve zoning the aforementioned area as non-residential. The next best scenario would preclude any residential within the 55 dBA contour line. This scenario will ensure that the facility is in compliance with the 7:00 A.M. to 10:00 P.M. daytime one hour $L_{EQ}$ noise ordinance of 55 dBA for the City of Chula Vista. However, concert noise will be plainly audible in some locations and complaints can be expected within this contour.

We suggest that amphitheater noise be classified as Environmental Noise rather than Nuisance Noise under the Chula Vista noise ordinance and that the amphitheater be granted an exemption or variance and allowed to conform to the 55 dBA $L_{EQ}$ until 11:30 P.M. rather than the current 10:00 P.M. The current ordinance allows 45 dBA after 10:00 P.M. Consequently, all performances should conclude by 11:30 P.M.

We highly recommend that the City of San Diego, like the City of Chula Vista, not allow residential development within the 50 dBA contour line. This should be accomplished by zoning the area in question non-residential.

The current San Diego noise ordinance limits noise levels (one hour $L_{EQ}$'s) at a R-1 zoned residential property line to 45 dBA between the hours of 7:00 P.M. and 10:00 P.M. and 40 dBA between 10:00 P.M. and 7:00 A.M. The results of the on-site sound test indicate that the facility on the proposed site may not conform to this criteria, assuming levels of 40 dBA could be measured in these neighborhoods. Daytime ambient noise levels in these areas are typically 42-45 dBA due to activity on highways 117, 805, Brown Field and Otay Valley Road. The advent of residential development will add to the ambient noise levels due to normal suburban life, including sounds such as power garden equipment, barking dogs, children playing, air conditioning compressors and local automobile traffic. Noise from these typical activities can be expected to be higher in level than amphitheater concert sound. For most occasions, concert sound should be at or below the neighborhood ambient noise level. Under these conditions, a violation of the 40 dBA noise standard is not possible to measure, as the concert noise can not be differentiated from other noises.

While concert noise may be difficult to measure reliably, its character is different from other sounds, allowing concert activity to be audible, even under circumstances where it is lower in level than the ambient noises occurring at the same time. It has been our experience that any time concerts can be heard, regardless of absolute level, a small fraction of the residential population will complain. For this reason, we recommend that the City of San Diego be included in a review of the anticipated noise impact.

# APPENDIX A : REFERENCES


1. Beranek, L.L., *Acoustics*, McGraw-Hill, New York, 1954
2. Harris, C.M., *Handbook of Acoustical Measurements and Noise Control*, Third Edition, McGraw-Hill, New York, 1991
3. Kryter, K.D., *The Effects of Noise on Man*, Second Edition, Academic Press, Orlando, 1985
4. *The Noise Guidebook*, US Department of Housing and Urban Development, 1971
5. Roederer, J.G., *Introduction to the Physics and Psychophysics of Music*, Second Edition, Springer-Verlag, New York, 1979
6. Wilson, C.E., *Noise Control*, Harper & Row, New York, 1989

# APPENDIX B : CITY OF CHULA VISTA NOISE ORDINANCE

ORDINANCE NO. 2101

AN ORDINANCE OF THE CITY OF CHULA VISTA AMENDING SECTION 19.66.060, REPEALING SECTION 19.66.070 AND ADDING CHAPTER 19.68 TO THE CHULA VISTA MUNICIPAL CODE RELATING TO PERFORMANCE STANDARDS AND NOISE CONTROL

The City Council of the City of Chula Vista does ordain as follows:

SECTION I: That Section 19.66.060 of Chapter 19.66 of the Chula Vista Municipal Code be, and the same is hereby amended to read as follows:

Sec. 19.66.060 Locations Where Determinations are to be Made.

The determination of the existence of any dangerous and objectionable elements shall be made at the location of the use creating the same and at any points where the existence of such elements may be more apparent (herein referred to as "at any point"); provided, however, that the measurements necessary for enforcement of performance standards set forth in Sections 19.66.080 through 19.66.150, namely those measurements having to do with vibration, odors or glare, shall be taken at the following points of measurement:

A. In any district except the I zone: at the lot line of the establishment or use;

B. In the I zone: five hundred feet from the establishment or use or at the boundary or boundaries of the zone if closer to the establishment or use, or at any point within an adjacent zone other than an I zone.

SECTION II: That Section 19.66.070 of the Chula Vista Municipal Code be, and the same is hereby repealed.

SECTION III: That Chapter 19.68 as more fully described in the attached Exhibit "A" shall be added to the Chula Vista Municipal Code as though fully set forth herein.

SECTION IV: This ordinance shall take effect and be in full force on the thity-first day from and after its adoption.

Presented by

/s/ George Krempl

George Krempl, Director of lanning

Approved as to form by

Charles R. Gill

Charles R. Gill, Assistant City Attorney

FIRST READ AT A REGULAR MEETING OF THE CITY COUNCIL OF THE CITY OF CHULA VISTA, CALIFORNIA, HELD February 5, 19 85, AND FINALLY PASSED AND ADOPTED AT A REGULAR MEETING THEREOF HELD February 19, 19 85, BY THE FOLLOWING VOTE, TO-WIT:

AYES: Councilmen Scott, Moore, Cox, Malcolm, McCandliss

NAYES: Councilmen None

ABSTAIN: Councilmen None

ABSENT: Councilmen None

/s/ Gregory R. Cox
Mayor of the City of Chula Vista

ATTEST /s/ Jennie M. Fulasz
City Clerk

STATE OF CALIFORNIA )
COUNTY OF SAN DIEGO ) ss.
CITY OF CHULA VISTA )

I, JENNIE M. FULASZ, CMC, CITY CLERK of the City of Chula Vista, California, DO HEREBY CERTIFY that the above and foregoing is a full, true and correct copy of ORDINANCE NO. 2101, and that the same has not been amended or repealed.

DATED February 20, 1985

Jennie M. Fulasz
City Clerk

(seal)

CC-660

EXHIBIT "A"

# CHAPTER 19.68
# PERFORMANCE STANDARDS AND NOISE CONTROL

Sections:



## Section 19.68.010 General Provisions

a. Title. The ordinance codified in this title shall be known and may be cited as "The Noise Control Ordinance" of the City of Chula Vista.

b. Declaration of findings and policy. Whereas, excessive noise and vibration are a serious hazard to the public health and welfare and the quality of life, and

Whereas, the people have a right to and should be ensured an environment free from noise and vibration that may jeopardize their health or welfare or degrade the quality of life;

Now, therefore, it is the policy of the city to prevent noise and vibration which may jeopardize the health or welfare of its citizens or degrade the quality of life.

c. Criteria. As criteria for this chapter, Table I is a chart showing sound levels and their expected impact in terms of human response. Table II is a list of National Goals for Noise Reduction as set forth by the U.S. Environmental Protection Agency in their publication "Toward a National Strategy for Noise Control" April 1977.

## TABLE I

SOUND LEVELS AND HUMAN REPSONSE

| Common Sounds | Noise Level (dB) | Effect |
|---|---|---|
| Carrier deck<br>Jet operation<br>Air raid siren | 140 | Painfully loud |
| Jet takeoff (200 feet)<br>Thunderclap | 130 | |
| Discotheque<br>Auto horn (3 feet) | 120 | Maximum vocal effort |
| Pile drivers<br>Chain saw (2 feet) | 110 | |
| Garbage truck<br>Power lawn mower (4 feet) | 100 | |
| Heavy truck (50 feet)<br>City traffic | 90 | Very annoying<br>Hearing damage (8 hours) |
| Alarm clock (2 feet)<br>Hair dryer<br>Vacuum cleaner (5 feet) | 80 | Annoying |
| Noisy restaurant<br>Freeway traffic<br>Man's voices (3 feet) | 70 | Telephone use difficult |
| Air conditioning unit (20 feet) | 60 | Intrusive |
| Light auto traffic (100 feet) | 50 | Quiet |
| Living room<br>Bedroom<br>Quiet Office | 40 | |
| Library<br>Soft whisper (15 feet) | 30 | Very quiet |
| Broadcasting studio | 20 | |
| | 10 | Just audible |
| | 0 | Hearing begins |

This decibel (dB) table compares some common sounds and shows how they rank in potential harm to hearing. Note that 70 dB is the point at which noise begins to harm hearing, that 60 dB is the threshold of stress response and 45 dB disturbs sleep. To the ear, each 10 dB increase seems twice as loud.

TABLE II

A. To take all practical steps to eliminate hearing loss resulting from noise exposure;

B. To reduce environmental noise exposure to an Ldn value of no more the 75 dB immediately;

C. To reduce noise exposure levels to Ldn 65 dB by vigorous regulatory and planning actions;

D. To strive for an eventual reduction of noise levels to an Ldn of 55 dB.

Section 19.68.020 Definitions

a. Terminology. All terminology used in this title, not defined in this chapter shall be in conformance with the American National Standards Institute standard ANSI S1.1 - 1971 Acoustical Terminology (attached by reference).

b. A-weighted sound level. "A-weighted sound level" means the sound level in decibels as measured on a sound level meter using the A-weighting network. The level so read is designated dB(A) or dBA.

c. Ambient noise level. "Ambient noise level" means the composite of noise from all sources near and far. In this context, the ambient noise level constitutes the normal or existing level of environmental noise at a given location and time.

d. Enforcement office(r). "Enforcement office(r)" means the City employee and/or police officer having lead responsibility for enforcing this chapter; and, the City employee having responsibility for making noise surveys, noise analyses, noise investigations and for the administration of this chapter.

e. Construction. "Construction" means any site preparation, assembly, substantial repair, alteration or similar action, for or of public or private rights-of-way, structures, utilities or similar property or similar activity upon public or private structures or land.

f. Continuous sound. "Continuous sound" means sound which is of a steady and uninterrupted nature of a specified time period. For the purposes of this title, the minimum time period shall be one hour.

g. Cumulative period. "Cumulative period" means an additive period of time composed of individual time segments which may be continuous or interrupted.

h. Day/night average sound level (Ldn). "Day/night average sound level (Ldn)" means a twenty-four hour average of the A-weighted sound level, with the level during the period 10 p.m. to 7 a.m. increased by 10 dB(a) before averaging. It is denoted "Ldn."

i. Decibel. "Decibel" means a unit for measuring the amplitude of sound, equal to twenty times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals.

j. Demolition. "Demolition" means any dismantling, intentional destruction or removal of structures, utilities, public or private right-of-way surfaces, or similar property.

k. Equivalent sound level (Leq). "Equivalent sound level (Leq)" means the average sound level measured over a stated time period.

l. Emergency work. "Emergency work" means any work performed for the purpose of preventing or alleviating the physical trauma or property damage threatened r cause by an emergency.

m. Environmental noise. See "Noise disturbance--environmental."

n. Fixed noise source. "Fixed noise source" means a stationary device which creates sounds while fixed or motionless, including but not limited to residential, agricultural, industrial and commercial machinery and equipment, pumps, fans, compressors, air conditioners, and refrigeration equipment.

o. Impulsive sound. "Impulsive sound" means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and the discharge of firearms.

p. Intermittent sound. "Intermittent sound" means sound which is not continuous or which is of a cyclic or repetitive nature.

q. Intrusive noise. "Intrusive noise" means that noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency and time of occurrence, and tonal or informational content as well as the prevailing ambient noise level.

r. Mobile noise source. "Mobile noise source" means any noise source other than a fixed noise source.

. Multiple Dwelling. "Multiple dwelling" means a building or portions therefor designed for or used exclusively for residence purposes by three or more families or housekeeping units, living independently of one another.

t. Noise disturbance. Any noise exceeding the noise level limits for a designated receiving land use category specified in Table III, or the prohibited actions as specified in Section 19.68.050 shall be deemed to be a noise disturbance.

(1) Noise Disturbance--Environmental. Those noise disturbances resulting from land use activity normally permitted under the land use code, but which exceed the noise level limits set by this code for that particular land use. Environmental noise sources are specified in, but not limited by the list in Appendix A.

(2) Noise Disturbance--Nuisance. Those noise disturbances, other than environmental noise disturbances, which because of their unusual presence are considered harmful to health and well-being, annoying, obnoxious, and unpleasant. Nuisance noise disturbances are specified in, but not limited to, the examples in Appendix A.

u. Noise sensitive zone. "Noise sensitive zone" means any area designated by the Planning Commission for the purpose of ensuring exceptional quiet.

v. Public right-of-way. "Public right-of-way" means any street, avenue, boulevard, highway, bikeway, sidewalk or alley or similar place which is owned or controlled by a government entity.

w. Public space. "Public space" means any real property or structures thereon which are owned or controlled by a governmental entity.

x. Pure tone. "Pure tone" means any sound which can be judged as audible as a single pitch or a set of single pitches by the enforcement officer or police officer.

y. Real property boundary. "Real property boundary" means an imaginary line along the ground surface, and its vertical extension, which separates the real property owner by one person from that owned by another person, but not including intra-building real property divisions.

z. Sound amplifying equipment. "Sound amplifying equipment," as used means any machine or device for the amplification of the human voice, music or any other sound. Sound amplifying equipment, as used in this title, shall not be construed as including standard automobile radios when used and heard only by occupant(s) of the vehicle in which installed, or warning devices on authorized emergency vehicles, or horns or other warning devices on other vehicles used only for traffic safety purposes. This definition shall include remotely located loudspeakers attached to and/or operated from a vehicle.

aa. Sound level meter. "Sound level meter" means an instrument, including a microphone, an amplifier, an output meter, and frequency weighting networks for the measurement of sound levels, which meets or exceeds the requirements pertinent for type S2A meters in American National Standards Institute specifications for sound level meters, S1.4-1971.

bb. Vibration perception threshold. "Vibration perception threshold" means the minimum ground-borne or structure-borne vibrational motion necessary to cause a normal person to be aware of the vibration by such direct means as, but not limited to, sensation by touch or visual observation of moving objects. The perception threshold shall be presumed to be a motion velocity of 0.01 in/sec over the range of 1 to 100 Hz.

cc. Weekday. "Weekday" means any day, Monday through Friday, which is not a legal holiday.

Section 19.68.030 Exterior Noise Limits

a. Maximum permissible sound levels by receiving land use.

(1) The noise standards for the various categories of land use as presented in Table III and set forth in terms defined in the City land use code set forth in Chapter 19.04, shall, unless otherwise specifically indicated, apply to each property or portion of property substantially used for a particular type of land use reasonably similar to the land use types shown in Table III. Where two or more dissimilar land uses occur on a single property, the more restrictive noise limits shall apply.

(2) Additional land use classifications may be added by action of the City Council to reflect both lower and higher existing ambient levels than those shown.

(3) Where doubt exists when making identification of receiving land use, the planning director may make an interpretation.

(4) No person shall operate or cause to be operated, any source of sound at any location within the city or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level to exceed the environmental and/or nuisance interpretation of the applicable limits given in Table III.

(5) 1. Environmental noise shall be measured by the equivalent sound evel (Leq) for any hour.

2. Nuisance noise shall be measured as a sound level not to be exceeded at any time.

3. Sound levels by receiving land use shall be measured at the boundary or at any point within the boundary of the property affected.

4. Fixed location public utility distribution or fixed transmission facilities, located on or adjacent to a property line shall be subject to noise level limits of this section measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

b. Corrections to exterior noise level limits.

(1) If the noise is continuous, the Leq for any hour will be represented by any lesser time period within that hour. Noise measurements of a few minutes only will thus suffice to define the noise level.

(2) If the noise is intermittent, the Leq for any hour may be represented by a time period typical of the operating cycle. Measurement should be made of a representative number of noisy/quiet periods. A measurement period of

not less than 15 minutes is, however, strongly recommended when dealing with intermittent noise.

(3) In the event the alleged offensive noise, as judged by the enforcement officer, contains a steady, audible sound such as a whine, screech or hum, or contains a repetitive impulsive noise such as hammering or riveting, the standard limits set forth in Table III shall be reduced by 5 dB.

(4) If the measured ambient level exceeds that permissible in Table III, the allowable noise exposure standard shall be the ambient noise level. The ambient level shall be measured when the alleged noise violations source is not operating.

TABLE III

EXTERIOR NOISE LIMITS [1, 2]

1. Environmental Noise - Leq in any hour.
2. Nuisance Noise - Not to be exceeded any time.

| Receiving Land Use Category | Noise Level [dB (A)] 10 p.m. to 7 a.m. | 7 a.m. to 10 p.m. |
|---|---|---|
| All residential (except multiple dwelling) | 45 | 55 |
| Multiple dwelling residential | 50 | 60 |
| Commercial | 60 | 65 |
| Light Industry - I-R and I-L Zone | 70 | 70 |
| Heavy Industry - I Zone | 80 | 80 |

Section 19.68.040 Interior Noise Limits

a. Maximum permissible dwelling interior sound levels.

(1) No person shall operate or cause to operate, any source of sound within a residential dwelling unit or allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured inside a neighboring receiving dwelling unit to exceed the environmental and/or nuisance interpretation of the applicable limits given in Table IV.

TABLE IV

| Type of Land Use | Time Interval | Noise Level (dBA) not to be Exceeded: Any Time | 1 min in 1 hr | 5 min in 1 hr |
|---|---|---|---|---|
| Multi-family Residential | 10 pm - 7 am | 45 | 40 | 35 |
| | 7 am - 10 pm | 55 | 50 | 45 |

(2) If the ambient noise level inside the receiving dwelling unit exceeds that permissible within any of the noise limit categories in Table IV, the allowable noise exposure standard in that category shall be the measured ambient for a cumulative period of five minutes in any hour, ambient plus 5 dB(A) for one minute in any hour and shall not exceed the ambient plus 10 dB(A) at any time.

Section 19.68.050 Prohibited Acts

a. Noise disturbances prohibited. No person shall unnecessarily make, continue, or cause to be made or continued, any noise disturbance.

b. Specific prohibitions. The acts set forth in this section, and the causing or permitting thereof, are declared to be in violation of this chapter.

c. Vibration. Operating or permitting the operation of any device that creates a vibration which is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at one hundred fifty feet from the source if on a public space or public right-of-way.

d. Stationary non-emergency signaling devices.

Sounding or permitting the sounding of any electrically operated or electronically amplified signal from any stationary bell, chime, siren, whistle, or similar device, intended primarily for non-emergency purposes, from any place, for more than 120 seconds continually, in an hourly period, or intermittent sounding over a 5 minute period in any hour.

e. Emergency signaling devices.

(1) The intentional sounding or permitting the sounding outdoors of any fire, burglar, or civil defense alarm, siren, whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing, as provided in subsection B of this section.

(2) (a) Testing of a stationary emergency signaling device shall not occur before 7 a.m. or after 7 p.m. Any such testing shall use only the minimum cycle test time. In no case shall such test time exceed 60 seconds.

(b) Testing of the complete emergency signaling system, including the functioning of the signaling device, and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall not occur before 7 a.m. or after 10 p.m. The time limit specified in subsection B(1) shall not apply to such complete system testing.

(3) Sounding or permitting the sounding of any exterior burglar or fire alarm or any motor vehicle burglar alarm for more than 15 minutes is prohibited.

- Noise sensitive zones.

(1) Creating or causing the creation of any sound within any noise sensitive zone, so as to exceed the specified land use noise standards set forth in therefore, provided, that conspicuous signs are displayed indicating the presence of the zone; or

(2) Creating or causing the creation of any sound within or adjacent to any noise sensitive zone, containing a hospital, nursing home, school, court or other designated area, so as to interfere with the functions of such activity or annoy the occupants in the activity; provided, that conspicuous signs are displayed indicating the presence of the zone.

Section 19.68.060 Special Provision (Exemptions)

a. Warning devices. Warning devices necessary for the protection of public safety, as for example, police, fire and ambulance sirens, and train horns, are exempted from the provisions of this title.

b. Outdoor activities. The provisions of this title shall not apply to occasional outdoor gatherings, public dances, shows, and sporting and entertainment events (excluding regularly scheduled school athletic events), provided the events are conducted pursuant to a permit or license issued by the city relative to the staging of the events. The permit authority, as set forth in Chapter 19.58 of the land use code, may, aside from this title, regulate and control noise caused by such outdoor activity.

c. Exemptions from exterior noise standards. The provisions of Section 19.68.030 shall not apply to activities covered by the following sections:

(1) Street sales--prohibited unless exception is granted per Section 19.68.070.

(2) Construction/demolition;

(3) Stationary non-emergency signaling devices;

(4) Emergency signaling devices;

(5) Motor vehicles operating on public right-of-way;

(6) Wherein noise limit exceptions or excesses are specifically provided for in the issuance of any temporary use permit pursuant to Chapter 19.54 and 19.58 or in City Council approval of any parades, civic functions or gatherings, such specifics shall prevail.

d. Federal or date preempted activities. Any other activity to the extent regulation thereof has been preempted by state or federal law.

Section 19.68.070 Exceptions

a. The City Council is authorized to grant exceptions for any environmental noise provision of this title, subject to limitations as to area, noise levels, time limits, and other terms and conditions as the city council determines are appropriate to protect the public health, safety, and welfare from the noise emanating therefrom. This section shall in no way affect the duty to obtain any permit or license required by law for such activities, not shall it apply to nuisance noises.

b. Any person seeking exceptions pursuant to this section shall file an application with the planning director. The application shall be submitted and processed in the same manner as conditional use permits. The application shall contain information which demonstrates that bringing the source of sound or activity for which the exception is sought into compliance with this title would constitute, an unreasonable hardship on the applicant, on the community, or on other persons.

Section 19.68.080 Enforcement

a. Violations and penalties.

(1) It is a violation for any property owner(s) and/or person(s) in control of property to permit, or cause, a noise disturbance to be produced upon property owned by them or under their control.

(2) It is a violation for any person or persons to create or allow the making of noise disturbance as provided by this title at any location in the city.

(3) The violation of this title by making or allowing an environmental noise disturbance shall be an infraction. Enforcement of environmental noise violations shall follow the procedures set forth in the land use code for zoning violations.

(4) The violation of this title by making or allowing a nuisance noise disturbance shall be an infraction. Subsection d. provides for the method of enforcement wherein noise may be in violation of both the environmental and nuisance noise disturbance provisions.

b. Environmental noise.

(1) Classification of environmental nose. The enforcement officer shall determine that any given obtrusive noise condition that falls within the definition of environmental noise disturbance, pursuant to Section 19.68.020 is an environmental noise. The enforcement officer may use Appendix A, attached to ordinance codified in this title, as an aid in making such determinations. The planning director may make "determinations" classifying noise sources not specifically mentioned in Appendix A.

(2) Responsibility. The building and housing director shall be responsible for investigation and enforcement of environmental noise disturbances.

(3) Guidelines. The building and housing director may, from time to time, promulgate guidelines for administration and enforcement of the provisions of this title pertaining to noise violations.

(4) Abatement shall terminate enforcement action. No complaint or further action shall be taken in the event that the cause of the violation has been removed, the condition abated or fully corrected within the time period specified in a notice of violation issued by the enforcement officer.

c. Nuisance noise.

(1) Classification of Nuisance Noise. The chief of police shall determine that any given obtrusive noise condition that falls within the definition of nuisance noise disturbance, pursuant to Section 19.6X.020 is a nuisance noise. The chief of police may use Appendix A, hereto, as an aid in making such determinations. At the request of the chief of police, the planning director may make "determinations" for classifying nuisance noise sources not specifically mentioned in Appendix A.

(2) Responsibility. The chief of police shall be responsible for investigation and enforcement of nuisance noise disturbances.

(3) Guidelines. The chief of police may, from time to time, promulgate guidelines for administration and enforcement of the provisions of this title pertaining to nuisance noise violations.

(4) Abatement Order. The officer responsible for enforcement of any provisions of this section may issue an order requiring abatement of a sound source alleged to be in violation within a reasonable time period and according to guidelines which the chief of police may prescribe. Such orders of abatement may be verbally administered. Failure to comply may be held as a violation of this title.

d. Enforcement of noise disturbances that are both environmental and nuisance.

(1) Where investigation reveals that offending noise violates both the environmental noise regulations and the nuisance noise regulations, the offense shall be enforced as a nuisance noise violation unless the chief of police makes a specific finding that the environmental noise regulations more nearly apply, in which case the environmental noise regulations shall apply.

(2) Nothing contained in this provision shall limit the City's ability to prosecute noise violations as both environmental and nuisance noise.

e. Violations: Additional remedies--Injunctions. As an additional remedy, the operation or maintenance of any device, instrument, vehicle or machinery in violation of any provision of this chapter which operation or maintenance causes or creates sound levels or vibration exceeding the allowable limits as specified in this chapter is declared to be a public nuisance, and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction. Additionally, no provision of this title shall be construed to impair any common law or statutory cause of action, or legal remedy therefrom, of any person or injury or damage arising from any violation of this title or from any other law.

Section 19.68.090 Appendices

a. Appendix A--Adoption. Appendix A to this title, codified in Subsection b is adopted concurrently with the adoption of the ordinance codified in this title.

b. Appendix A--Designated.

## APPENDIX A

## CLASSIFICATION OF NOISE SOURCES

| ENVIRONMENTAL NOISE | NUISANCE NOISE |
|---|---|
| Air-conditioning units (fixed) | Air-conditioning units (improperly maintained) |
| Animal shelters | Animal, pets |
| Auto and vehicle repair in conjunction with permitted commercial or industrial activity | Auto and vehicle repairs on residential sites |
| | Carbide ignitors and similar devices producing impactive noise |
| Commercial activities normally found in connection with a permitted activity | Commercial activities, other than those permitted which are causing a nuisance. Also, outdoor commerical sales activities |
| | Construction/demolition activities (of a temporary nature) |
| Industrial activities normally found in conjunction with a permitted activity | Industrial activities, other than environmental and causing a nuisance |
| Loading and unloading in conjunction with permitted uses | Loading and unloading, other than environmental, and causing a nuisance |

| ENVIRONMENTAL NOISE | NUISANCE NOISE |
|---|---|
| Loose shutters, squeaky gates, clattering drain covers, and other conditions resulting from inadequate property maintenance | |
| Machinery and compressors (fixed or maintained in conjunction with a permitted activity) | Machinery and compressors other than environmental |
| | Off-road vehicles |
| | Outcrying, shouting, screaming, whistling, singing |
| | Powered model toys, devices, vehicles and equipment |
| Power tools normally found in conjunction with permitted uses | Power tools, other than environmental. Also, hobby activities |
| Lawn mowers | |
| Pumps - Same as machinery and compressors | Pumps - Same as machinery and compressors |
| | Private parties, gatherings, assemblages of limited duration |
| Public address and public assembly, indoor and outdoor, as permitted use | Public address and public assembly, indoor and outdoor, as "temporary use" or as an assembly other than environmental |
| | Radios, stereos, T.V.'s sound amplifiers, musical instruments, drums |
| Signaling devices (non-emergency stationary<br>Outside phone bells<br>School bells | Signaling devices (non-emergency) mobile utility truck radio speakers |
| | Emergency:<br>Burglar alarms<br>Auto theft alarms |
| | Sound trucks |

WPC 0040B

# APPENDIX C : CITY OF SAN DIEGO NOISE ORDINANCE

## DIVISION 4
## Limits

*(Added 9-18-73 by O-11122 N.S.)*
*(Amended 9-22-76 by O-11916 N.S.; former title Noise Level Limits, Standards and Control.)*

### § 59.5.0401 Sound Level Limits

A. It shall be unlawful for any person to cause noise by any means to the extent that the one-hour average sound level exceeds the applicable limit given in the following table, at any location in the City of San Diego on or beyond the boundaries of the property on which the noise is produced. The noise subject to these limits is that part of the total noise at the specified location that is due solely to the action of said person.

TABLE OF APPLICABLE LIMITS

| Land Use Zone | Time of Day | One-Hour Average Sound Level (decibels) |
|---|---|---|
| 1. Residential: All R-1 | 7 a.m. to 7 p.m. | 50 |
| | 7 p.m. to 10 p.m. | 45 |
| | 10 p.m. to 7 a.m. | 40 |
| 2. All R-2 | 7 a.m. to 7 p.m. | 55 |
| | 7 p.m. to 10 p.m. | 50 |
| | 10 p.m. to 7 a.m. | 45 |
| 3. R-3, R-4 and all other Residential | 7 a.m. to 7 p.m. | 60 |
| | 7 p.m. to 10 p.m. | 55 |
| | 10 p.m. to 7 a.m. | 50 |
| 4. All Commercial | 7 a.m. to 7 p.m. | 65 |
| | 7 p.m. to 10 p.m. | 60 |
| | 10 p.m. to 7 a.m. | 60 |
| 5. Manufacturing, all other Industrial, including Agricultural and Extractive Industry | any time | 75 |

B. The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts. Permissible construction noise level limits shall be governed by Sections 59.5.0404 of this article.

C. Fixed-location public utility distribution or transmission facilities located on or adjacent to a property line shall be subject to the noise level limits of Part A. of this section, measured at or beyond six feet from the boundary of the easement upon which the equipment is located.

D. This section does not apply to firework displays authorized by permit from the Fire Department.

E. This section does not apply to noise generated by helicopters at heliports or helistops authorized by a conditional use permit, nor to any roller coaster operated on City-owned parkland.

*(Amended 9-11-89 by O-17337 N.S.)*

### § 59.5.0402 Motor Vehicles

A. Off-Highway

1. Except as otherwise provided for in this article, it shall be unlawful to operate any motor vehicle of any type on any site, other than on a public street or highway as defined in the California Vehicle Code, in any manner so as to cause noise in excess of those noise levels permitted for on-highway motor vehicles as specified in the table for "45 mile-per-hour or less speed limits" contained in Section 23130 of the California Vehicle Code, and as corrected for distances set forth in subsection A.2. below.

2. Corrections

The maximum noise level as the off-highway vehicle passes may be measured at a distance of other than fifty (50) feet from the center line of travel, provided the measurement is further adjusted by adding algebraically the applicable correction as follows:

| Distance (feet) | Correction (decibels) |
|---|---|
| 25 | - 6 |
| 28 | - 5 |
| 32 | - 4 |
| 35 | - 3 |
| 40 | - 2 |
| 45 | - 1 |
| 50 (preferred distance) | 0 |
| 56 | +1 |
| 63 | +2 |
| 70 | +3 |
| 80 | +4 |
| 90 | +5 |
| 100 | +6 |

3. A measured noise level thus corrected shall be deemed in violation of this section if it exceeds the applicable noise-level limit as specified above.

B. Nothing in this section shall apply to authorized emergency vehicles when being used in emergency situations, including the blowing of sirens and/or horns.

*(New Sec. 59.5.0402 Motor Vehicles — Added 9-22-76 by O-11916 N.S. — formerly Sec. 59.5.0403.)*

### § 59.5.0403 Watercraft

Violations for excessive noise of watercraft operating in waters under the jurisdiction of The City of San Diego shall be prosecuted under applicable provisions of the California Harbors and Navigation Code. Permits issued by The City of San Diego for the operation of watercraft not in compliance with noise criteria of the Harbors and Navigation Code shall be reviewed and approved by the Administrator prior to issuance.

*(New Section 59.5.0403 Watercraft, added and amended 9-22-76 by O-11916 N.S. formerly Sec. 59.5.0407.)*

## § 59.5.0404 Construction Noise

A. It shall be unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays as specified in Section 21.04 of the San Diego Municipal Code, with exception of Columbus Day and Washington's Birthday, or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise unless a permit has been applied for and granted beforehand by the Noise Abatement and Control Administrator. In granting such permit, the Administrator shall consider whether the construction noise in the vicinity of the proposed work site would be less objectionable at night than during the daytime because of different population densities or different neighboring activities; whether obstruction and interference with traffic particularly on streets of major importance, would be less objectionable at night than during the daytime; whether the type of work to be performed emits noises at such a low level as to not cause significant disturbances in the vicinity of the work site; the character and nature of the neighborhood of the proposed work site; whether great economic hardship would occur if the work were spread over a longer time; whether proposed night work is in the general public interest; and he shall prescribe such conditions, working times, types of construction equipment to be used, and permissible noise levels as he deems to be required in the public interest.

B. Except as provided in subsection C. hereof, it shall be unlawful for any person, including The City of San Diego, to conduct any construction activity so as to cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

C. The provisions of subsection B. of this section shall not apply to construction equipment used in connection with emergency work, provided the Administrator is notified within 48 hours after commencement of work.

*(Amended 1-3-84 by O-16100 N.S.)*

## § 59.5.0405 Construction Activities

*(Repealed 1-3-84 by O-16100 N.S.)*

## § 59.5.0406 Refuse Vehicles and Parking Lot Sweepers

No person shall operate or permit to be operated a refuse compacting, processing or collection vehicle or parking lot sweeper between the hours of 7:00 p.m. to 7:00 a.m. in any residential area unless a permit has been applied for and granted by the Administrator.

*(Sec. 59.5.0406 Refuse Vehicles — Added 9-18-73 by O-11122 N.S.; amended 9-22-76 by O-11916 N.S.)*

## § 59.5.0407 Watercraft

*(Renumbered 9-22-76 by O-11916 N.S., now Sec. 59.5.0403.)*

## § 59.5.0408 Construction Noise

*(Renumbered 9-22-76 by O-11916 N.S., now Sec. 59.5.0404.)*

## § 59.5.0409 Construction Equipment

*(Renumbered 9-22-76 by O-11916 N.S., now Sec. 59.5.0405.)*

## § 59.5.0410 Containers and Construction Material

*(Repealed 9-22-76 by O-11916 N.S.)*

## § 59.5.0411 Exterior Noise Isolation Standards

*(Repealed 9-22-76 by O-11916 N.S.)*

## § 59.5.0412 Train Horns and Whistles — Excessive Sound Prohibited

*(Repealed 9-22-76 by O-11916 N.S.)*

## § 59.5.0413 Signal Device for Food Trucks

*(Repealed 9-22-76 by O-11916 N.S.)*

## DIVISION 5
## Public Nuisance Noise

*(Added 9-18-73 by O-11122 N.S.; Amended 9-22-76 by O-11916 N.S. which changed title to Public Nuisance Noise — formerly General Noise Regulations.)*

### § 59.5.0501 General Prohibitions

A. It shall be unlawful for any person to make, continue, or cause to be made or continued, within the limits of said City, any disturbing, excessive, or offensive noise which causes discomfort or annoyance to any reasonable person of normal sensitiveness residing in the area.

B. The characteristics and conditions which should be considered in determining whether a violation of the provisions of this section exists should include, but not be limited to the following:

1. The level of the noise;
2. Whether the nature of the noise is usual or unusual;
3. Whether the origin of the noise is natural or unnatural;
4. The level of the ambient noise;
5. The proximity of the noise to sleeping facilities;
6. The nature and zoning of the area from which the noise emanates and the area where it is received;
7. The time of day or night the noise occurs;
8. The duration of the noise; and
9. Whether the noise is recurrent, intermittent, or constant.

*(Amended 1-3-84 by O-16100 N.S.)*

### § 59.5.0502 Disturbing, Excessive, Offensive Noises — Declaration of Certain Acts Constituting

The following activities, among others, are declared to cause disturbing, excessive or offensive noises in violation of this section and are unlawful, namely:

A. Horns, Signaling Devices, etc.

Unnecessary use or operation of horns, signaling devices, or other similar devices, on automobiles, motorcycles, or any other vehicle.

B. Radios, Television Sets, Phonographs, Loud Speaking Amplifiers and Similar Devices

1. Uses Restricted

The use or operation of any sound production or reproduction device, radio receiving set, musical instrument, drums, phonograph, television set, loud speakers and sound amplifier or other similar machine or device for the producing or reproducing of sound in such a manner as to disturb the peace, quiet, or comfort of any reasonable person of normal sensitivity in any area of the City is prohibited. This provision shall not apply to any participant in a licensed parade, or to any person who has been otherwise duly authorized by The City of San Diego to engage in such conduct.

2. Prima Facie Violations

Any of the following shall constitute evidence of a prima facie violation of this section:

(a) The operation of any such sound production or reproduction device, radio receiving set, musical instrument, drum, phonograph, television set, machine, loud speaker and sound amplifier or similar machine or device between the hours of 10:00 p.m. and 8:00 a.m. in such a manner as to be plainly audible at a distance of fifty feet from the building, structure, or vehicle in which it is located.

(b) The operation of any sound amplifier, which is part of, or connected to, any radio, stereo receiver, compact disc player, cassette tape player, or other similar device when operated in such a manner as to be plainly audible at a distance of fifty (50) feet and when operated in such a manner as to cause a person to be aware of vibration accompanying the sound at a distance of fifty (50) feet from the source.

3. Enforcement of Prima Facie Violations

(a) Any person who is authorized to enforce the provisions of this Article and who encounters evidence of a prima facie violation of this section is empowered to confiscate and impound as evidence, any or all of the components amplifying or transmitting the sound.

(b) Any peace officer, as defined in Chapter 4.5 (commencing with Section 830) of the Penal Code, who encounters evidence of a prima facie violation of this section whereby the component(s) amplifying or transmitting the sound are attached to a vehicle may, in accordance with the provisions of California Vehicle Code section 22655.5, impound the vehicle, as containing evidence of a criminal offense, when the amplifying and/or transmitting component(s) cannot be readily removed from the component(s) or vehicle without damaging the component(s) or vehicle.

C. Animals

1. The keeping or maintenance, or the permitting to be kept or maintained upon any premises owned, occupied, or controlled by any person of any animal or animals which by any frequent or long-continued noise, shall cause annoyance or discomfort to a reasonable person of normal sensitiveness in the vicinity.

2. The noise from any such animal or animals that disturbs two or more residents residing in separate residences adjacent to any part of the property on which the subject animal or animals are kept or maintained, or three or more residents residing in separate residences in close proximity to the property on which the subject animal or animals are kept or maintained shall be prima facie evidence of a violation of this section.

D. Hospitals, Schools, Libraries, Rest Homes, Long- Term Medical or Mental Care Facilities

To make noise adjacent to a hospital, school, library, rest home, or long-term medical or mental care facility, which noise unreasonably interferes with the workings of such institutions or which disturbs or unduly annoys occupants in said institutions.

E. Playing of Radios on Buses and Trolleys

The operation of any radio, phonograph, or tape player on an urban transit bus or trolley so as to emit noise that is audible to any other person in the vehicle is prohibited.

F. Playing of Radios, Phonographs, and Other Sound Production or Reproduction Devices in Public Parks and Beach Areas and Public Parking Lots and Streets Adjacent Thereto.

The operation of any radio, phonograph, television set, or any other sound production or reproduction device in any public park or on any public beach or any public parking lot or street adjacent to such park or beach, without the prior written approval of the City Manager or the Administrator, in such a manner that such radio, phonograph, television set or sound production or reproduction device emits a sound level exceeding those found in the following table at any point ten (10) feet or more from the noise source is prohibited:

TABLE OF APPLICABLE LIMITS

| Time of Day | Sound Level Limit |
|---|---|
| 7 a.m. to 7 p.m. | 65 decibels |
| 7:01 p.m. to 6:59 a.m. | 55 decibels |

*(Amended 10-30-89 by O-17380 N.S.)*

## § 59.5.0503 Burglar Alarms

A. Audible burglar alarms for structures or motor vehicles are prohibited unless the operation of such burglar alarms can be terminated within 20 minutes of being activated.

B. Notwithstanding the requirements of this provision, any member of the Police Department of The City of San Diego shall have the right to take such steps as may be reasonable and necessary to disconnect any such alarm installed in any building, dwelling, or motor vehicle at any time during the period of its activation. On or after thirty (30) days from the effective date of this article, any building, dwelling or motor vehicle upon which a burglar alarm has been installed shall prominently display the telephone number at which communication may be made with the owner of such building, dwelling, or motor vehicle.

*(Amended 1-3-84 by O-16100 N.S.)*

## DIVISION 6
## Violations And Enforcement
*(Added 9-18-73 by O-11122 N.S.)*

### § 59.5.0601 Violations: Misdemeanors

Any person violating any of the provisions of this article shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined in an amount not exceeding five hundred dollars ($500) or be imprisoned in the City or County jail for a period not exceeding six (6) months, or by both such fine and imprisonment. Each day such violation is committed or permitted to continue shall constitute a separate offense and shall be punishable as such.

*(Added 9-18-73 by O-11122 N.S.)*

### § 59.5.0602 Violations: Additional Remedies: Injunctions

As an additional remedy, the operation or maintenance of any activity, device, instrument, vehicle or machinery in violation of any provision of this article, which operation or maintenance causes discomfort or annoyance to reasonable persons of normal sensitiveness or which endangers the comfort, repose, health, or peace of residents in the area, shall be deemed, and is declared to be, a public nuisance, and may be subject to abatement summarily by a restraining order or injunction issued by a court of competent jurisdiction.

*(Amended 9-22-76 by O-11916 N.S.)*

### § 59.5.0603 Enforcement

*(Repealed 9-22-76 by O-11916 N.S.)*

### § 59.5.0604 Manner of Enforcement

Violations of this article shall be prosecuted in the same manner as other misdemeanor violations of the San Diego Municipal Code; however, nothing in this article shall prevent the Administrator, in his enforcement of the provisions of this article for which he is responsible, from making efforts to obtain voluntary compliance by way of warning, notice, or educational means.

*(Added 9-18-73 by O-11122 N.S.)*

### § 59.5.0605 Display of Permits and Other Notices

Any permit or certificate required herein shall be displayed or maintained on the premises designated on the permit.

*(Added 9-18-73 by O-11122 N.S.)*

### § 59.5.0606 False and Misleading Statement: Unlawful Reproduction or Alteration of Documents

A. No person shall knowingly make a false or misleading statement or submit a false or misleading document to the Administrator as to any matter within his jurisdiction.

B. No person shall make, reproduce, alter, or cause to be made, reproduced, or altered, a permit, certificate, or other document issued by the Administrator or required by this article.

*(Amended 9-22-76 by O-11916 N.S.)*

### § 59.5.0607 Severability

If any provision, clause, sentence, or paragraph of this article or the application thereof to any person or circumstances shall be held invalid, such invalidity shall not affect the other provisions or applications of the provisions of this article which can be given effect without the invalid provision or application, and to this end the provisions of this article are hereby declared to be severable.

*(Added 9-22-76 by O-11916 N.S.)*

## DIVISION 7
## Noise Insulation In Buildings

*(Old Division 7 — Exemptions — Added 9-18-73 by O-11122 N.S.; repealed 9-22-76 by O-11916 N.S.)*
*(New Division 7 — Noise Insulation In Buildings — Added 8-9-82 by O-15796 N.S.)*

### § 59.5.0701 Noise Insulation In Residential Buildings

(a) Hotel, motel and apartment buildings, and dwellings other than detached single-family dwellings, shall conform with the provisions of Section T25-28 Noise Insulation Standards, of Article 4, Subchapter 1, Chapter 1, Division T25, Part 6, Title 24, California Administrative Code.

(b) Detached single-family dwellings proposed for construction on or after July 1, 1983, when located in an area with an aircraft generated community noise equivalent level (CNEL) of 65 decibel or greater, shall conform with the provisions of Subsection (e), entitled "Noise Insulation from Exterior Sources," of Section T25-28 referenced above.

(c) Sound level determinations for purposes of implementing this section shall be determined in accordance with the procedures set forth in Section 59.5.0206.

*(New Sec. 59.5.0701 Noise Insulation In Residential Buildings Added 8-9-82 by O-15796 N.S.)*

## DIVISION 8
## Sound Trucks — Loud Speakers — Sound Amplifiers

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0801 Sound Trucks — Loud Speakers — Sound Amplifiers Defined

(a) "Sound Truck" — shall mean any motor vehicle, or any other vehicle regardless of motive power, whether in motion or stationary, having mounted thereon or attached thereto, any sound amplifying equipment.

(b) "Sound Amplifying Equipment" — the words, "sound amplifying equipment" as used herein shall mean any machine or device for the amplification of the human voice, music or any other sound. "Sound amplifying equipment" as used herein shall not be construed as including standard automobile radios when used and heard only by occupants of the vehicle in which installed or warning devices on authorized emergency vehicles or horns or other warning devices on other vehicles used only for traffic safety purposes.

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0802 Noncommercial Use of Sound Trucks — Registration Required

It shall be unlawful for any person to use or cause to be used a sound truck with its sound amplifying equipment in operation for noncommercial purposes in the City of San Diego before filing a registration statement with the Director of the Communications Division of the General Services Department. This registration statement shall be filed in duplicate and shall state the following:

(a) Name and home address of the applicant;

(b) Address of place of business of applicant;

(c) License number and body style, make and year of the sound truck to be used by applicant;

(d) Name and address of person who owns the sound truck;

(e) Name and address of person having direct charge of the sound truck;

(f) Names and addresses of all persons who will use or operate the sound truck;

(g) The purpose for which the sound truck will be used;

(h) A general statement as to the section or sections of the City in which the sound truck will be used;

(i) The proposed hours of operation of the sound truck;

(j) The number of days of proposed operation of the sound truck;

(k) A general description of the sound amplifier and of each accessory unit to be used with it.

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0803 Endorsement of Registration Statement of Noncommercial Sound Trucks

All persons using or causing to be used sound trucks for noncommercial purposes shall submit their sound trucks together with the sound amplifying and sound reproducing equipment which they intend to use to an inspection to be given by or under the direction of the Director of the Communication Division of the General Services Department of the City of San Diego. The Deputy Director shall test said equipment in the course of his inspection and shall endorse the original registration statement of the person applying for a permit, together with the copies of said statement, if said equipment may be calibrated and/or controlled so as to comply with the regulations provided in this Division. Said endorsement shall designate the calibration or points at which the controls of the sound amplifying and reproducing equipment may be set in order to maintain the maximum sound level permissible under the regulatory provisions of this Division.

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0804 Registration Statement Amendment

Any person using, or causing to be used, sound trucks for noncommercial purposes shall amend any registration statement filed pursuant to Section 59.5.0802 within forty-eight (48) hours after any change in the information therein furnished.

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0805 Registration and Identification

The Director of the Communications Division of the General Services Department shall return to each applicant under Section 59.5.0802 one copy of said registration statement duly certified by the Director of the Communications Division of the General Services Department as a correct copy of said application. Said certified copy of the application, as endorsed, shall be in the possession of any person operating the sound truck at all times while the sound truck's sound amplifying equipment is in operation and said copy shall be promptly displayed and shown to any officer of the City of San Diego, upon request.

*(Added 2-23-87 by O-16813 N.S.)*

### § 59.5.0806 Regulations for Use

Noncommercial use of sound trucks in the City of San Diego with sound amplifying equipment in operation shall be subject to the following regulations:

(a) The only sounds permitted are music or human speech.

(b) Operations are permitted between the hours of 8:00 a.m. and 9:00 p.m. at and during public events and affairs of interest to the general public.

(c) Sound amplifying equipment shall not be operated unless the sound truck upon which such equipment is mounted is operated at a speed of at least ten (10) miles per hour except when said truck is stopped or impeded by traffic. Where stopped by traffic the said sound amplifying equipment shall not be operated for longer than one minute at each stop.

(d) Sound shall not be issued within one hundred (100) yards of hospitals, schools, churches, or courthouses.

(e) No sound truck with its amplifying device in operation shall be operated within the Central Traffic District of the City of San Diego as said Central Traffic District is defined in Chapter VIII.

(f) The human speech and music amplified shall not be obscene, lewd, indecent or slanderous.

(g) The volume of sound shall be controlled so that said volume is not unreasonably loud, raucous, jarring, disturbing or a nuisance to persons within the area of audibility and so that the volume of sound shall not exceed an "A" weighted sound level of 65 decibels on the "slow" scale at a distance of 50 feet from the sound amplifying equipment as measured by a sound level meter which meets "American National Standard" ANSI S1.4-1983 or its successor.

(h) No sound amplifying equipment shall be operated unless the axis of the center of any sound reproducing equipment used shall be parallel to the direction of travel of the sound truck; provided, however, that any sound reproducing equipment may be so placed upon said sound truck as to not vary more than 15 (degrees) either side of the axis of the center of the direction of travel.

(i) No sound truck with its amplifying device in operation shall be driven on the same street past the same point more than twice in a period of one hour.

(j) It shall be unlawful to operate a noncommercial sound truck in violation of these regulations.

*(Added 2-23-87 by O-16813 N.S.)*

## § 59.5.0807 Commercial Use Sound Truck Regulated — License Required

It shall be unlawful for any person to operate or cause to be operated any sound truck in the City of San Diego for commercial advertising purposes with sound amplifying equipment in operation unless an application has been made to the Director of the Communications Division of the General Services Department and said application has been approved and endorsed. The Director shall inspect and test said sound truck together with its sound amplifying and sound reproducing equipment to operate and conform to the regulatory provisions provided in Section 59.5.0806.

Said sound trucks shall be inspected on an annual basis to insure that their operation remains in conformity to the regulatory provisions contained in Section 59.5.0806. In the event said sound truck is found in violation of any regulatory provision contained in Section 59.5.0806, said violation shall be cause for revocation of such license.

*(Added 2-23-87 by O-16813 N.S.)*

## § 59.5.0808 Application for License

Persons applying for the license required under Section 59.5.0807, shall file with the Director of the Communications Division of the General Services Department an application in writing, giving in said application the information required in the registration statement required in Section 59.5.0802 and deposit the fee prescribed therefor in the City Composite Rate Schedule.

*(Added 2-23-87 by O-16813 N.S.)*

## § 59.5.0809 Issuance of License

A license shall be issued under Section 59.5.0807 upon payment of the required permit fee, unless the application required in Section 59.5.0808 hereof has been denied by the Director of the Communications Division of the General Services Department as indicated by writing or stamping with his signature "DENIED" on a copy of the license application.

*(Added 2-23-87 by O-16813 N.S.)*

## § 59.5.0810 Possession and Display of License

A licensee shall keep such license in his possession in the sound truck during the time the sound truck's sound amplifying equipment is in operation. The license shall be promptly displayed and shown to any officer of the City of San Diego, upon request.

*(Added 2-23-87 by O-16813 N.S.)*

## § 59.5.0811 Regulations for Use

It shall be unlawful for any person to operate or cause to be operated any sound truck for commercial sound advertising purposes in violation of the regulations set forth in Section 59.5.0806.

*(Added 2-23-87 by O-16813 N.S.)*

APPENDIX D

AIR QUALITY

**Giroux & Associates**
Environmental Consultants

# AIR QUALITY IMPACT ANALYSIS

## MCA AMPHITHEATER PROJECT

## CITY OF CHULA VISTA, CALIFORNIA

Prepared for:

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Date:

May 31, 1995

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## AIR QUALITY SETTING

### Meteorology/Climate

The climate of Chula Vista, as with all of Southern California, is largely controlled by the strength and position of the semi-permanent high pressure center over the Pacific Ocean. The high pressure ridge over the West Coast creates a repetitive pattern of frequent early morning cloudiness, hazy afternoon sunshine, clean daytime onshore breezes and little temperature change throughout the year. Limited rainfall occurs in winter when the oceanic high pressure center is weakest and farthest south as the fringes of mid-latitude storms occasionally move through the area. Summers are often completely dry with an average of 10.3 inches of rain falling each year from November to early April at Lower Otay Reservoir, the nearest climate station to the project site.

Unfortunately, the same atmospheric conditions that create a desirable living climate, combine to limit the ability of the atmosphere to disperse the air pollution generated by the large population attracted to the San Diego County climate. The onshore winds across the coastline diminish quickly when they reach the foothill communities east of San Diego, and the sinking air within the offshore high pressure system forms a massive temperature inversion that traps all air pollutants near the ground. The resulting horizontal and vertical stagnation, in conjunction with ample sunshine, causes a number of reactive pollutants to undergo photochemical reactions and form smog that degrades visibility and irritates tear ducts and nasal membranes.

Because coastal areas are well ventilated by fresh breezes during the daytime, they generally do not experience the same frequency of air pollution problems found in some areas east of Chula Vista. Unhealthful air quality within the San Diego Air Basin's southern coastal communities does occur at times in summer during limited localized stagnation, but occurs mainly in conjunction with the occasional intrusion of polluted air from the Los Angeles Basin into the County. Localized elevated pollution levels may also occur in winter during calm stable conditions near freeways, shopping centers or other major traffic sources, but such clean air violations are highly localized in space and time and would not normally be found near the project site. Except for the occasional interbasin transport, air quality in the project vicinity is probably quite good.

Local meteorological conditions in the project vicinity have not been routinely monitored, but they likely conform to the regional pattern of strong onshore winds by day, especially in summer, and weak offshore winds at night, especially in winter. These local wind patterns are driven by the temperature difference between the normally cool ocean and the warm interior and steered by any local topography. In summer, moderate breezes of 8-12 mph blow onshore and upvalley from the SW by day, and may continue all night as a light onshore breeze when the land remains warmer than the ocean. In winter, the onshore flow is weaker and reverses to blow from the NE in the evening as the land becomes cooler than the ocean.

Both the onshore flow of marine air and the nocturnal drainage winds are accompanied by two characteristic temperature inversion conditions that further control the rate of air pollution dispersal throughout the air basin. The daytime cool onshore flow is capped by a deep layer of warm, sinking air. Along the coastline, the marine air layer beneath the inversion cap is deep enough to accommodate any locally generated emissions. However, as the layer moves inland, pollution sources (especially automobiles) add pollutants from below without any dilution from above through the inversion interface. When this progressively polluted layer approaches foothill communities east of coastal developments, it becomes shallower and exposes residents in those areas to the concentrated reacted by-products of coastal area sources.

A second inversion type occurs when slow drainage or stagnation of cool air at night creates localized cold "pools" while the air above the surface remains warm. Such radiation inversions occur throughout the San Diego area but are strongest within low, channelized river valleys. They may trap vehicular exhaust pollutants such as carbon monoxide (CO) near their source until these inversions are destroyed by surface warming the next morning. Any such CO "hot spots" are highly localized in space and time (if they occur at all), but occasionally stagnant dispersion conditions are certainly an important air quality concern in combination with continued intensive development of the Chula Vista area. The intensity of development near the project site is extremely low such that non-local background pollution levels during nocturnal stagnation periods are also low. The local airshed, therefore, has considerable excess dispersive capacity that limits the potential for any localized air pollution "hot spots" from project implementation.

## Air Quality

Ambient Air Quality Standards (AAQS): In order to gauge the significance of the air quality impacts of the proposed MCA Amphitheater project, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people whose current health condition makes them most susceptible to further respiratory distress, such as asthmatics, the elderly, very young children, people already weakened by other diseases or illness and persons engaged in strenuous work or exercise, called "sensitive receptors."

Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone at levels that just meet Federal AAQS may nevertheless have an adverse respiratory health impact. Just meeting standards may not provide a sufficient health protection cushion for sensitive receptor populations.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended to 1987 for certain National AAQS, and that deadline passed with the San Diego Air Basin (SDAB) still far from attainment. A California Clean Air Act (AB-2595) and a new Federal Clean Air Act have both since been promulgated that establish more realistic implementation timeframes for airsheds with moderately degraded air quality such as SDAB. Because California had established AAQS several years before the Federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between State and Federal clean air standards. Those standards currently in effect in California are shown in Table 1.

Baseline Air Quality: The nearest air quality measurements to the project site are made in downtown Chula Vista by the San Diego County Air Pollution Control District (APCD), the agency responsible for air quality planning, monitoring and enforcement in the SDAB. A monitoring station on Otay Mesa slightly closer to the project site than downtown Chula Vista was opened in 1991. This site, however, does not monitor the complete spectrum of pollutants and its monitoring history is too short to establish accurate trends. The downtown Chula Vista data are therefore used as a basis for characterizing the existing project site air quality environment.

Table 2 summarizes the last seven complete years (final 1994 data have not been officially published) of monitoring data from the Chula Vista (80 East J. St.) station. Progress toward cleaner air is seen in almost every pollution category in Table 2. The only federal clean air standard that was exceeded throughout the 6-year monitoring period was the hourly ozone standard which was exceeded

Table 1

# State of California
# Air Resources Board
# Ambient Air Quality Standards

| Pollutant | Averaging Time | California Standards | | National Standards | | |
|---|---|---|---|---|---|---|
| | | Concentration | Method | Primary | Secondary | Method |
| Ozone | 1 Hour | 0.09 ppm (180 ug/m3) | Ultraviolet Photometry | 0.12 ppm (235 ug/m3) | Same as Primary Std. | Ethylene Chemiluminescence |
| Carbon Monoxide | 8 Hour | 9.0 ppm (10 mg/m3) | Non-dispersive Infrared Spectroscopy (NDIR) | 9 ppm (10 mg/m3) | | Non-dispersive Infrared Spectroscopy (NDIR) |
| | 1 Hour | 20 ppm (23 mg/m3) | | 35 ppm (40 mg/m3) | | |
| Nitrogen Dioxide | Annual Average | - | Gas Phase Chemiluminescence | 0.053 ppm (100 ug/m3) | Same as Primary Std. | Gas Phase Chemiluminescence |
| | 1 Hour | 0.25 ppm (470 ug/m3) | | - | | |
| Sulfur Dioxide | Annual Average | - | Ultraviolet Fluorescence | 80 ug/m3 (0.03 ppm) | - | Pararosoaniline |
| | 24 Hour | 0.04 ppm (105 ug/m3) | | 365 ug/m3 (0.14 ppm) | - | |
| | 3 Hour | - | | - | 1300 ug/m3 (0.5 ppm) | |
| | 1 Hour | 0.25 ppm (655 ug/m3) | | - | - | |
| Suspended Particulate Matter ($PM_{10}$) | Annual Geometric Mean | 30 ug/m3 | Size Selective Inlet High Volume Sampler and Gravimetric Analysis | - | - | Inertial Separation and Gravimetric Analysis |
| | 24 Hour | 50 ug/m3 | | 150 ug/m3 | Same as Primary Standard | |
| | Annual Arithmetic Mean | - | | 50 ug/m3 | | |
| Sulfates | 24 Hour | 25 ug/m3 | Turbidimetric Barium Sulfate | - | - | - |
| Lead | 30 day Average | 1.5 ug/m3 | Atomic Absorption | - | - | Atomic Absorption |
| | Calendar Quarter | - | | 1.5 ug/m3 | Same as Primary Std. | |
| Hydrogen Sulfide | 1 Hour | 0.03 ppm (42 ug/m3) | Cadmium Hydr-oxide STRactan | - | - | - |
| Vinyl Chloride (chloroethene) | 24 Hour | 0.010 ppm (26 ug/m3) | Tedlar Bag Collection, Gas Chromatography | - | - | - |
| Visibility Reducing Particles | 8 hour (10 am to 6 pm, PST) | In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent. Measurement in accordance with ARB Method V. | | - | - | - |

ARB Fact Sheet 39; (revised 11/91)

TABLE 2

CHULA VISTA AREA AIR QUALITY MONITORING SUMMARY
(Days Standards Were Exceeded and Maxima For Periods Indicated)

| Pollutant/Standard | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|---|---|---|
| <u>Ozone</u>: | | | | | | | |
| 1-Hour > 0.09 ppm | 15 | 17 | 21 | 21 | 13 | 14 | 12 |
| 1-Hour > 0.12 ppm | 2 | 4 | 7 | 3 | 3 | 4 | 1 |
| 1-Hour ≥ 0.20 ppm | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Max. 1-Hour Conc. (ppm) | 0.16 | 0.22 | 0.16 | 0.15 | 0.15 | 0.15 | 0.13 |
| <u>Carbon Monoxide</u>: | | | | | | | |
| 1-Hour > 20. ppm | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 8-Hour > 9. ppm | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Max. 1-Hour Conc. (ppm) | 7 | 7 | 8 | 7 | 7 | 7 | 5 |
| Max. 8-Hour Conc. (ppm) | 3.4 | 3.6 | 4.7 | 4.8 | 3.9 | 3.8 | 3.5 |
| <u>Nitrogen Dioxide</u>: | | | | | | | |
| 1-Hour > 0.25 ppm | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Max. 1-Hour Conc. (ppm) | 0.15 | 0.21 | 0.16 | 0.13 | 0.12 | 0.15 | 0.09 |
| <u>Total Suspended Particulates</u>: | | | | | | | |
| 24-Hour ≥ 100 $\mu g/m^3$ | 1/30 | 4/46 | 3/57 | 1/61 | 2/50 | 0/30 | 0/23 |
| 24-Hour > 260 $\mu g/m^3$ | 0/30 | 0/46 | 0/57 | 0/61 | 0/50 | 0/30 | 0/23 |
| Max. 24-Hour Conc. ($\mu g/m^3$) | 100 | 109 | 111 | 163 | 110 | 79 | 98. |
| <u>Particulate Sulfate</u>: | | | | | | | |
| 24-Hour ≥ 25. $\mu g/m^3$ | 0/51 | 0/57 | 0/60 | 0/51 | 0/21 | 0/29 | 0/31 |
| Max. 24-Hour Conc. ($\mu g/m^3$) | 13.3 | 17.2 | 16.5 | 16.8 | 11.2 | 9.9 | 19.0 |
| <u>Inhalable Particulates (PM-10)</u>: | | | | | | | |
| 24-Hour > 50 $\mu g/m^3$ | 5/61 | 3/56 | 7/61 | 7/62 | 7/60 | 2/60 | 2/60 |
| 24-Hour > 150 $\mu g/m^3$ | 0/61 | 0/56 | 0/61 | 0/62 | 0/60 | 0/60 | 0/60 |
| Max. 24-Hour Conc. ($\mu g/m^3$) | 68 | 58 | 69 | 67 | 73 | 54 | 56 |

Note: Standards for sulfur dioxide and particulate lead have been met with a wide margin of safety in 1987-93, and are, therefore, not shown. Data for total suspended particulates (TSP) shown for information only because there is no TSP air quality standard since 1987.

Source: California Air Resources Board, Summary of Air Quality Data, 1987-93. Chula Vista APCD Monitoring Station (except for some particulate data which are from San Diego APCD Downtown Station.)

an average of less than 4 times per year (once per year is allowable). The more stringent State standards for ozone and for 10-micron diameter respirable particulate matter (PM-10) were exceeded on a somewhat higher frequency; but, overall air quality in Chula Vista, as representative of the MCA Amphitheater project site, is nevertheless very good in comparison to other areas of the SDAB.

There are no clear-cut trends in the Chula Vista baseline air quality data in Table 2 except to note that any improvement of the few standards routinely exceeded is very slow. Some very encouraging trends are seen in Table 2, particularly for the most recent data. For example, in 1993, Chula Vista recorded the following air pollution records in its monitoring history:

- fewest violations of the California hourly ozone standard
- fewest violations of federal ozone standards
- lowest annual 1-hour ozone maximum
- lowest annual 1-hour CO maximum
- lowest annual 1-hour $NO_2$ maximum

Extrapolation of the pollution trendline suggests that limited violations of standards could occur into the future but with decreasing frequency. Since observed San Diego County ozone air quality sometimes derives from the southward drift of pollution from the South Coast Air Basin (which is forecast to continue to exceed ozone standards to the year 2010), some ozone standard violations will likely occur in the County beyond the 1999 attainment target date despite Countywide pollution control efforts. A further improvement in ambient air quality from County-generated emissions reductions will thus occur within the next decade, but complete attainment of all standards may not happen until after the turn of the century.

**Sources of Pollution:** Nitrogen oxides ($NO_x$) and reactive organic gases (ROG) are the two precursors to photochemical smog formation. In San Diego County, 68% of the 310 tons per day of ROG emitted come from mobile (cars, ships, planes, heavy equipment, etc.) sources. For $NO_x$, 88% of the 240 tons emitted daily are from mobile sources. Computer modeling of smog formation has shown that a reduction of around 25% each of $NO_x$ and ROG would allow the San Diego Air Basin to meet the federal ozone standard on days when there is no substantial transport of pollution from the South Coast Air Basin.

**Air Quality Management Planning:** The continued violations of national AAQS in the SDAB, particularly those for ozone in inland foothill areas, requires that a plan be developed outlining the pollution controls that will be undertaken to improve air quality. In San Diego County, this attainment planning process is embodied in a regional air quality management plan developed jointly by the APCD and SANDAG. Several plans had been adopted in the late 1970's and early 1980's under the title Regional Air Quality Strategies (RAQS). Until recently, the 1982 RAQS was the last federally-approved (EPA) air quality plan for attainment of the federal ozone standard. More recent planning efforts have been modifications, improvements and updates of the earlier RAQS efforts.

The California Clean Air Act (AB-2595) required that a state clean air plan be developed to address meeting state standards as well as the often less stringent federal criteria. A basin plan was therefore developed and adopted in 1991 that predicts attainment of all national standards by the end of 1997 from pollution sources within the air basin, but little can be done about the problem of interbasin transport. Since the South Coast Air Basin is predicted to exceed the national ozone standard beyond the year 2000, the San Diego Air Basin, will also not experience completely healthful air for the next several decades.
A plan to meet the federal standard for ozone was developed in 1994 during the process of updating the 1991 state plan. This local plan was combined with those from all other California non-attainment areas with serious ozone problems to create the California State Implementation Plan (SIP). The SIP was adopted by the Air Resources Board (ARB) after public hearings on November 9-10, 1994, and forwarded to the U. S. EPA for their approval.

During the planning process and smog formation modeling, it was discovered that the SDAB can meet the federal ozone standard by the year 1999 without the creation of any new control programs not already in progress. Airsheds demonstrating an ability to meet standards by 1999 (in the absence of transport from one basin to another) are classified as having a "serious" ozone problem instead of being classified as "severe". The SDAPCD requested that EPA reclassify the air basin from severe to serious. This request was subsequently approved.

All progress towards attainment, including offsetting the effects of growth, is expected to derive from existing local, state and federal rules and regulations. Controversial rules previously evaluated that were judged by some people as overly intrusive into personal lifestyles (mandatory trip reduction programs or minimum average vehicle occupancy goals) are not needed to predict attainment. Any violations of ozone standards in the year 2000 or beyond are forecast to occur only on days when transport from the Los Angeles Basin creates substantially elevated baseline levels upon which any local basin impacts would be superimposed.

In general, commercial developments such as the proposed amphitheater are not of themselves emitters of air pollutants. Traffic-generating sources are called "indirect sources". Project consistency with any regional air quality planning is determined in terms of whether overall growth has been correctly anticipated in a given sub-region. An entertainment complex serves the general population, and will not cause automotive travel to be generated unless there is a perceived demand for such a venue. By and large, commercial uses are growth-accommodating and not growth-inducing. The are thus related to the air quality planning process only inasmuch as the rate of growth they are accommodating by providing entertainment services is consistent with the air quality planning process.

## AIR QUALITY IMPACTS

The proposed project will impact air quality almost exclusively through the vehicular traffic generated by larger events held at the amphitheater. Mobile source impacts occur basically on two scales of motion. Regionally, site-related travel will add to regional trip generation and increase the vehicle miles traveled (VMT) within the local airshed. Locally, project traffic, will be added to the Chula Vista roadway system near the project site. If such traffic occurs during periods of poor atmospheric ventilation, is comprised of a large number of vehicles "cold-started" at the conclusion of a major event and operating at pollution inefficient speeds, and is driving on roadways already crowded with non-project traffic, there is a potential for the formation of microscale air pollution "hot spots" in the area immediately around points of congested traffic.

Secondary project-related atmospheric impacts derive from a number of other small, growth-connected emissions sources such as temporary emissions of dusts and fumes during project construction, increased fossil-fuel combustion in power plants from greater lighting requirements, evaporative emissions at gas stations or from paints, thinners or solvents used in construction and maintenance, increased air travel from area visitors, dust from tire wear and re-suspended roadway dust, etc. All these emission points are either temporary, or they are so small in comparison to project-related automotive sources that their impact is less important. They do point out, however, that growth engenders increased air pollution emissions from a wide variety of sources, and thus further inhibits the near-term attainment of all clean air standards in the San Diego Air Basin (SDAB).

### Standards of Significance

CEQA guidelines define a potentially significant air quality impact as one that:

a. creates violations of clean air standards,
b. contributes measurably to an existing violation of standards, or,
c. exposes people to contaminants for which there are no presumed safe exposures.

For projects that create mainly automobile traffic whose emissions require complex photochemical reactions to reach their most harmful stage, there is no way to measure the impact to establish a "measurable contribution". Various air pollution control/management agencies have developed guidelines using total project emissions as a surrogate for determining regional impact potential. The City of Chula Vista has no such threshold levels, but relies on guidance from other agencies. Candidate significance threshold levels include the following:

| | Significant Emissions (lb/day) | | | | |
|---|---|---|---|---|---|
| Agency | CO | ROC | NOx | SOx | PM-10 |
| SDAPCD Rule 20.2 (a) | 550 | 100 | 100 | 100 | 100 |
| SDAPCD Rule 20.3 (b) | 550 | 250 | 250 | 250 | 250 |
| City of San Diego (c) | 550* | 100** | --- | --- | --- |
| South Coast AQMD (d) | 550 | 55 | 55 | 150 | 150 |

a = requires best available control
b = requires ambient air quality analysis
c = Significance Determination Guidelines (1991)
d = SCAQMD CEQA Air Quality Handbook (1993)

* = in areas of congested traffic
** = in areas of free-flow traffic

As noted below, project-related vehicular emissions of carbon monoxide (CO), reactive organic compounds (ROC) and nitrogen oxides ($NO_x$) for near-term development exceed the above threshold levels for any of the candidate significance criteria. Even for horizon years, CO emissions will exceed the 550 pound threshold by a wide margin. Since the 550 pound level is common to all four candidate criteria, the selection of any of the above four significance levels is immaterial. For purposes of analysis, the SDAPCD Rule 20.2 (BACT-trigger) is a reasonable compromise between the most stringent and most lenient of the four possible significance thresholds.

## Construction Impacts

Construction activities are generally divided into two phases. Phase I represents grading and site preparation activities while Phase II is the actual construction. Dominant emissions during Phase I are dust from surface disturbance and heavy equipment exhaust. Phase II emissions are dominated by trucks hauling building materials, by evaporative emissions from asphalt or surface coatings and from smaller on-site equipment.

The most significant source of air pollution from Phase I project construction will be the dust generated during excavation, grading and site preparation. Typical dust lofting rates from construction activities are usually assumed to average 1.2 tons of dust per month per acre disturbed in the absence of any dust control procedures. These emissions are for total suspended particulates (TSP) which comprise smaller, respirable particulate matter of 10-micron diameter or less (called PM-10), as well as larger particles that are trapped within the upper respiratory tract of people and other mammals. The PM-10 fraction of TSP is assumed to be around 50 percent. The PM-10 emission factor for amphitheater excavation is around 55 pounds per day per acre disturbed.

Much of the site has been graded for the Otay Rio Business Park such that grading activities for the parking lots will be minor. The most extensive construction activity will take place within the 20 acre site comprising the amphitheater itself. In the absence of any dust control, simultaneous disturbance of the 20 acre bowl would generate daily total PM-10 emissions of 1100 pounds if no mitigation measures are implemented. Implementation of vigorous dust control measures would reduce PM-10 associated with grading by 50-75 percent or in the range of 275-550 pounds per day. This generation of construction dust PM-10 emissions can be reduced to sub-threshold levels by reducing the area of disturbance and using a very aggressive dust control program. Assuming that an aggressive dust control program is implemented during construction, then with the temporary timeframe of such emissions and the generally good daytime ventilation conditions in the project vicinity, the impact from construction dust generation would be considered as individually less than significant.

In addition to small dust particles that remain suspended in the air semi-indefinitely, construction also generates many large particles that are easily filtered by human breathing passages, but settle out rapidly on parked cars and other nearby horizontal surfaces. Large particle emissions thus comprises more of a soiling nuisance rather than any potentially unhealthful air quality impact. With prevailing daytime west to east winds, dust soiling potential is likely greatest directly east of the project site along Otay Valley Road. Good control of fine particulates also results in reduction in nuisance potential from larger particulate matter. While dust deposition can be minimized, it often can not be completely eliminated. While temporary soiling nuisance is considered adverse, it does not constitute a significant air quality impact.

Equipment exhaust as well will be released during Phase I construction activities from mobile sources during site preparation and berm construction. Approximately 500,000 cubic yards of earth will be excavated to excavate the bowl and recompacted to form the grass seating berm. For purposes of analysis, it was assumed that three months of earthmoving are required to create the bowl topography and that the equipment energy expenditure totals 200,000 Brake-Horsepower-Hours (BHP-HR) for each of the 20 or so acres under construction in the amphitheater area. Equipment exhaust emissions are calculated based upon average diesel-powered equipment as follows:

| | | |
|---|---|---|
| Carbon Monoxide | - | 95 pounds/day |
| Reactive Organic Compounds | - | 30 pounds/day |
| Nitrogen Oxides | - | 430 pounds/day |
| Sulfur Oxides | - | 30 pounds/day |
| Exhaust Particulates | - | 15 pounds/day |

Construction activity emission rates are substantial (especially $NO_x$ from diesel-fueled trucks and on-site vehicles) and well in excess of the threshold level of 100 pounds per day established for this project. Equipment exhaust emissions may therefore have a temporarily significant air quality impact during the most intensive phase of construction. Locally, equipment emissions will be widely dispersed in space and time by the mobile nature of much of the equipment itself. Furthermore, daytime ventilation during much of the year in Chula Vista is usually more than adequate to disperse any local pollution accumulations near the project site. Any perceptible impacts from construction activity exhaust will, therefore, be confined to an occasional "whiff" of characteristic diesel exhaust odor, but not in sufficient concentration to expose any nearby receptors to air pollution levels above acceptable standards.

Construction activities are most noticeable in the immediate vicinity of the construction site. There is, however, some potential for "spill-over" into the surrounding community. Spillage may be physical such as dirt tracked onto public streets or dropped from trucks. Spill-over may also be through congestion effects where detours, lane closures, or construction vehicle competition with non-project peak hour traffic slows traffic beyond the immediate construction site to less pollution-efficient travel speeds. Such off-site effects are controllable through good housekeeping and proper construction management/scheduling. Management techniques are suggested in the mitigation discussion to reduce potential spill-over impacts.

**Long-Term Vehicular Emissions Impacts**

The greatest air quality concern from land use intensification usually derives from the mobile source emissions that result from project-related transportation.

The project traffic study estimates that site-related traffic will total 15,320 daily vehicle trips on a peak activity day with a daytime swap meet and an evening sold-out concert. This trip generation forecast was calculated to generate an additional 153,200 vehicle miles traveled (VMT) at an average trip length of approximately 10 miles. The corresponding air pollution emissions associated with increased site access was calculated by combining the VMT data with average vehicular emission factors from the EMFAC7F(1.1) California vehicular emissions computer model. The daily mobile-source emissions for a peak event are shown in Table 3.

Project-related new mobile source emissions substantially exceed the 100 pound per day new source threshold for smog-forming ROC and $NO_x$ for all years analyzed. Daily CO emissions similarly exceed the 550 pound per day level by a wide margin.

It should be noted that less than 60 events per year are projected for the amphitheater when fully operational. Not all events will be sell-outs with maximum traffic. On an average daily basis, the emissions will be substantially less than those shown in Table 3. Further, most MCA amphitheater events are expected to occur during evening hours. Since the excess ROC and $NO_x$ emissions primarily occur during the evening and nighttime hours, the formation of photochemical smog is limited because the vehicular emissions will be many miles from Chula Vista the next day when there is sunshine to drive the smog formation process. Smog precursor emissions above the threshold may therefore not necessarily have a significant impact.

Emissions have been assumed 100% "new" emissions. However, many event attendees will likely participate in other forms of entertainment involving driving for the "no project" alternative. If any substantial fraction of attendees drove to other concert

# TABLE 3

## PROJECT-RELATED VEHICULAR EMISSIONS
(lbs/day)

| Pollutant | 1996 | 2000 | 2010 | Significance Threshold |
|---|---|---|---|---|
| ROC | 604 | 382 | 179 | 100. |
| $NO_x$ | 396 | 287 | 201 | 100. |
| CO | 4685 | 3094 | 1523 | 550. |
| PM-10 | 36 | 35 | 33 | 100. |
| $SO_x$ | Negl. | Negl. | Negl. | 100. |

venues, or went to movies, clubs or other entertainment if not to the amphitheater, the calculated "new" emissions would be offset by an almost similar regional contribution to the overall emissions burden.

These mitigating circumstances are somewhat speculative and are difficult to quantify. For the sake of conservatism, the regional air quality impact should be considered as significant. Because of the wide disparity between project-related emissions and the significance threshold, there is little likelihood of reducing the substantial excess to a less than significant level. Mobile source emissions should therefore be considered to have a significant, and non-mitigable, regional air quality impact.

Increased traffic around the project site could create localized violations of ambient health standards. Anticipated CO concentrations were calculated to evaluate the potential for the formation of any air pollution "hot spots" at intersections near the proposed project site using a screening procedure based upon the California line source dispersion model CALINE4. Maximum simultaneous background and event traffic volumes projected by the project traffic study were used in the analysis. CO was used as the indicator pollutant to determine if there was any air pollution "hot spot" potential. Five (5) intersections were analyzed. Table 4 shows that peak hourly CO concentrations are 4.5 ppm above background, and will diminish as cleaner cars replace the current vehicle fleet.

Maximum hourly background CO levels at Chula Vista in 1993 were 5 ppm with an 8-hour maximum of 3.5 ppm. Even if the worst background day were to coincide with the worst local impact, neither the 1- or 8-hour CO standards would be exceeded.

Therefore project-related microscale air quality impacts will be less than significant, and project-related CO emissions will not significantly contribute to any unhealthful air quality in the project vicinity.

# TABLE 4

## MICROSCALE AIR QUALITY IMPACT ANALYSIS

(Hourly CO concentrations (ppm) above background)

| Intersection | 1995 Exist.* | 1996 Opening** | 2010 Interim** |
|---|---|---|---|
| SB I-805 @ Main Street | 1.4 | 0.5 | 0.5 |
| NB I-805 @ Otay Valley Road | 1.3 | 0.6 | 0.5 |
| Oleander @ Otay Valley Road | 1.1 | 0.4 | 0.5 |
| Brandywine @ Otay Valley Road | 1.1 | 0.3 | 0.6 |
| Otay Mesa Road @ Heritage | 4.5 | 2.4 | 0.7 |

Source: Screening Procedure Based on CALINE4 Model

* = 4 - 5 p.m. peak background

** = 7 - 8 p.m. simultaneous maximum of background plus sold-out event traffic.

## MITIGATION

Without mitigation, the proposed MCA Amphitheater project may create significant air quality impacts from dust and equipment exhaust during construction (short-term) and from long-term, travel-related emissions (vehicle exhaust and roadway dust). There are more opportunities to reduce short-term construction impacts to insignificant levels through mitigation than opportunities to reduce long-term impacts. Potential impacts that have been identified include the following:

1. Dust (PM-10) emissions during bowl excavation activities may exceed significance criteria unless aggressive dust control procedures are implemented or areas of disturbance are limited.

2. Vehicular and construction equipment emissions of nitrogen oxides ($NO_x$) during bowl excavation may exceed significance criteria.

3. Vehicular emissions of reactive organic compounds (ROC) and $NO_x$ during sold-out or near capacity events will exceed the significance criterion of 100 pounds per day for each ozone precursor, and will exceed the 550 pound per day CO emissions significance threshold.

Recommendations to achieve a less than significant air quality impact during construction include:

- Dust control measures required by the SDAPCD will be implemented during construction. Such measures include maintaining adequate soil moisture as well as removing any soil spillage onto traveled roadways through site housekeeping procedures.

- Reducing interference with existing traffic and preventing truck queuing on any public roadways should be incorporated into any project construction permits. The permits should limit operations to daytime periods of better dispersion that minimizes localized pollution accumulation.

- Using the option of limiting grading activity such that no more than approximately half of the amphitheater area is under disturbance at any time.

The following mitigation measures to reduce construction dust may be implemented. For each of the three dust sources, the first listed measure represents a reasonably available control measure (RACM), while the second measure represents best available control technology (BACT).

| Source | Mitigation Measure |
|---|---|
| Soil Piles | 1. Enclose, cover, or water all soil piles twice daily.<br>2. Install an automatic sprinkler system on all soil piles. |
| Exposed Surface/ Grading | 3. Water all exposed soil twice daily.<br>4. Water all exposed soil with adequate frequency to keep soil moist at all times. |
| Truck Travel-Internal | 5. Water all internal roads daily.<br>6. Pave all internal roads. |

As an alternative dust control option, grading activities may be staged such that no more than half of the site in under disturbance at any one time. Implementation of RACMs, in conjunction with limits on the size of the disturbance area, would reduce emissions for this option below significance threshold.

The primary mitigation measure for grading and other construction equipment (both mobile and stationary) is to maintain equipment in good working order. An equipment maintenance program is recommended to assure that construction equipment is maintained. Implementation of this mitigation measure has been conservatively estimated to result in a five percent (5%) reduction in equipment emissions. In addition, encouraging of employee carpooling and use of public transit by employees has been estimated to create a ten percent (10%) reduction in employee trips during construction.

Because nitrogen oxide ($NO_x$) emissions associated with bowl excavation are more than three times the significance threshold of 100 pounds per day, the limited emissions reduction from maintaining equipment in good working order will not reduce $NO_x$ emissions below the significance threshold. However, this measure should still be implemented.

Since long-term impacts are primarily derived from traffic generation during sold-out or near capacity events, the following traffic-related mitigations are recommended:

- Provide facilities to encourage the use of alternative transportation methods. This would include encouraging access by buses and other multi-occupant vehicles during major events, and providing bicycle lockers or racks on the site.

- Encourage satellite parking with shuttle services to reduce access/egress congestion and to alleviate possible parking space shortfalls. Shuttle services will increase the already positive anticipated 3+ passenger per vehicle average vehicle ridership (AVR) for concert attendance.

- Implement transportation demand management (TDM) procedures for major events to evaluate optimum access/ egress routes and to encourage site access by alternatives to the single or low occupant vehicle. Procedures developed during the first few major events should be refined for subsequent facility use.

Implementation of these measures is estimated to provide a five percent (5%) reduction in trips generated, and a similar reduction in vehicular emissions. Even with this reduction, vehicular CO, ROC and $NO_x$ emissions for a sold-out or near capacity event are expected to exceed the significance threshold at least until about the year 2010. By then, vehicular emissions may be reduced to below significant levels by the use of cleaner burning vehicles and fuels. Regional air quality impacts from vehicular emissions are thus judged to be significant and not mitigable to a less than significant level.

APPENDIX E

BIOLOGY

# Report of a Biological Survey and Impact Assessment of the 72.5 Acre MCA Amphitheater Site City of Chula Vista, San Diego County, California

499,500 mN; 3,605,500 mN; 11; N

Prepared for

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3 May 1995
(Revised 8 May 1995)

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## FIGURES, TABLES AND APPENDICES

# REPORT OF A BIOLOGICAL SURVEY AND IMPACT ASSESSMENT OF THE 72.5 ACRE MCA AMPHITHEATER SITE CITY OF CHULA VISTA, SAN DIEGO COUNTY, CALIFORNIA

*Pacific Southwest Biological Services, Inc.*
01 May 1995

## EXECUTIVE SUMMARY

Pacific Southwest Biological Services, Inc. conducted a biological survey and impact assessment of the 72.5 acre MCA Amphitheater Site. In addition, surrounding lands located adjacent to the proposed project site were surveyed for Coastal California Gnatcatchers (*Polioptila Californica californica*). Coastal California Gnatcatchers were not found on the MCA Amphitheater site but were found in the project vicinity.

The proposed amphitheater project is located entirely within an existing graded area and, therefore, no new direct impacts to biological resources are expected. Indirect impacts may result from lights shining into the Otay River Floodway, increased noise, human encroachment into the Otay River, and fugitive refuse. Mitigation measures to reduce these secondary impacts to biological resources, including shielding lights to prevent glare from projecting into the Otay River, construction of barriers to reduce noise and lighting impacts, and installation of fencing to prevent human encroachment into the riparian habitat of the Otay River are recommended.

## 1.0 Introduction

At the request of the City of Chula Vista, Pacific Southwest Biological Services conducted an updated biological survey of the 72.5 acre MCA Amphitheater project site situated within the former Otay Rio Business Park located within the southern portion of the City of Chula Vista, California, in the Otay River Valley. The proposed project site lies completely within the eastern third of the abandoned 210 acre Business Park site, and lies in the western half of the southwest quarter and the southeast quarter of the southwest quarter of Section 20, Township 18 South, Range 1 West of the San Bernardino Base and Meridian, USGS 7.5' Imperial Beach Quadrangle.

A biological survey was performed on-site and in specified surrounding areas as part of a biological study in preparation of an Environmental Impact Report. Previous field surveys have been performed on-site and in the MCA project vicinity to the north, east, and south. The purpose of the current survey effort was to update existing biological information and to identify sensitive biological resources potentially affected by the proposed project, particularly as they relate to indirect impacts on the Least Bell's Vireo (*Vireo bellii pusillus*) and California Gnatcatcher.

Elevations on-site vary from a low of approximately 125 feet at the extreme northwest corner of the site to a high of approximately 225 feet along the southern border. The MCA Amphitheater site is located on a terrace on the floodplain of the Otay River with Riverwash and Salinas Clay Loam soils on gentler slopes and Diablo Clays on steeper slopes (Bowman 1973). The underlying geologic materials consist of Alluvium and Undifferentiated Slope Wash, Stream Terrace Deposits and the Mission Valley Formation (Kennedy 1977).

This site was formerly fallow agricultural fields which were ultimately replaced by pad development of the now abandoned Business Park. Existing landscaped vegetation and barren ground have succumbed to invasion by non-native vegetation such as Black Mustard (*Brassica nigra*), Short-pod Mustard (*Hirschfeldia incana*), Tocalote (*Centaurea melitensis*), Fennel (*Foeniculum vulgare*), ripgut grass (*Bromus diandrus*), and Barley (*Hordeum murinum* ssp. *leporinum*). There are scattered native shrub Broom Baccharis (*Baccharis sarothroides*) about the site and in surrounding areas. Other non-native vegetation in the area includes non-native Tasmanian Blue-gum (*Eucalyptus globulus*) to the north and west (PSBS 1987). No sensitive plant species were observed within the project boundary (footprint).

## 1.1 PROJECT LOCATION

The MCA Amphitheater project site is located on approximately 72.5 acres of disturbed lands within the Otay River Valley. It is located in the southern portion of the City of Chula Vista, approximately four miles north of the United States-Mexico International Border (Figure 1). The project site is within the City of Chula Vista's Eastern Territories Community Planning Area, as designated by the City of Chula Vista General Plan. The property is bounded by the Otay River to the north and Otay Valley Road to the east (Figure 2). Regional access is provided by Otay Valley Road.

The project site was previously developed as the Otay Rio Business Park - Phase I which currently includes building pads, landscaped entrances and embankments, street improvements, and utilities. The graded building pads are terraced descending from the south to the north; no buildings have been constructed at the project site.

The surrounding properties are predominantly undeveloped land. To the north of the site is the Otay River which includes a natural floodway with undisturbed vegetation. Directly to the northeast of the site is a small utility yard. Further to the north of the Otay River is Otay Valley Road, with commercial recycling/auto recycling facilities further to the north. Further to the north is the Otay Landfill operated by the County of San Diego. To the east of the site is Otay Valley Road and undeveloped land, with the exception of a trap and skeet shooting range. Further to the east is a rock quarry and rock crushing operation. To the south of the site are steep, undeveloped hills which have been and are currently being used for motorcycle and other off-road vehicle activity. Further to the south

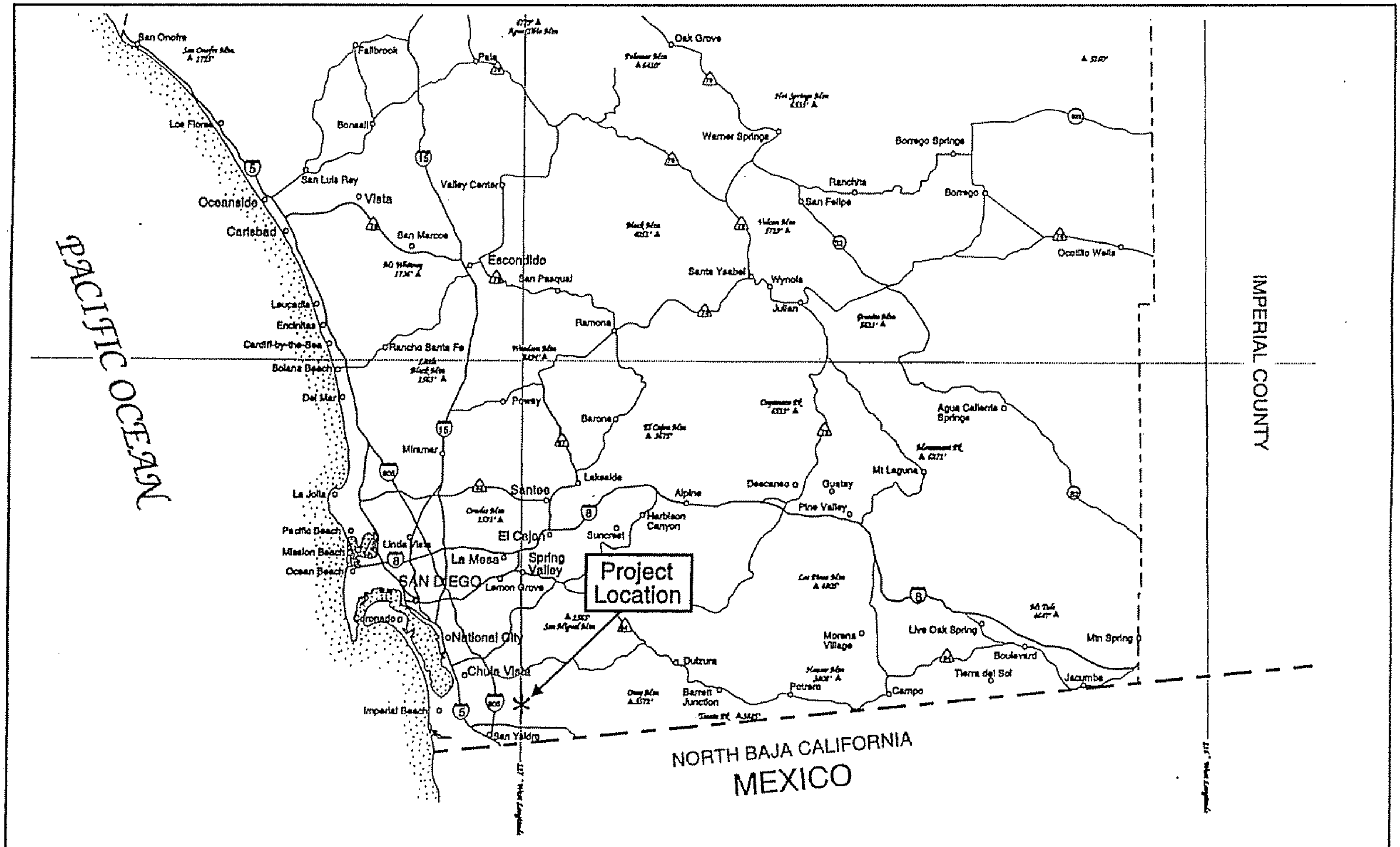



Figure 1. Project Location Map

N
W E
S

1" = 11.82 miles

*Pacific Southwest Biological Services, Inc.*

PSBS # S12

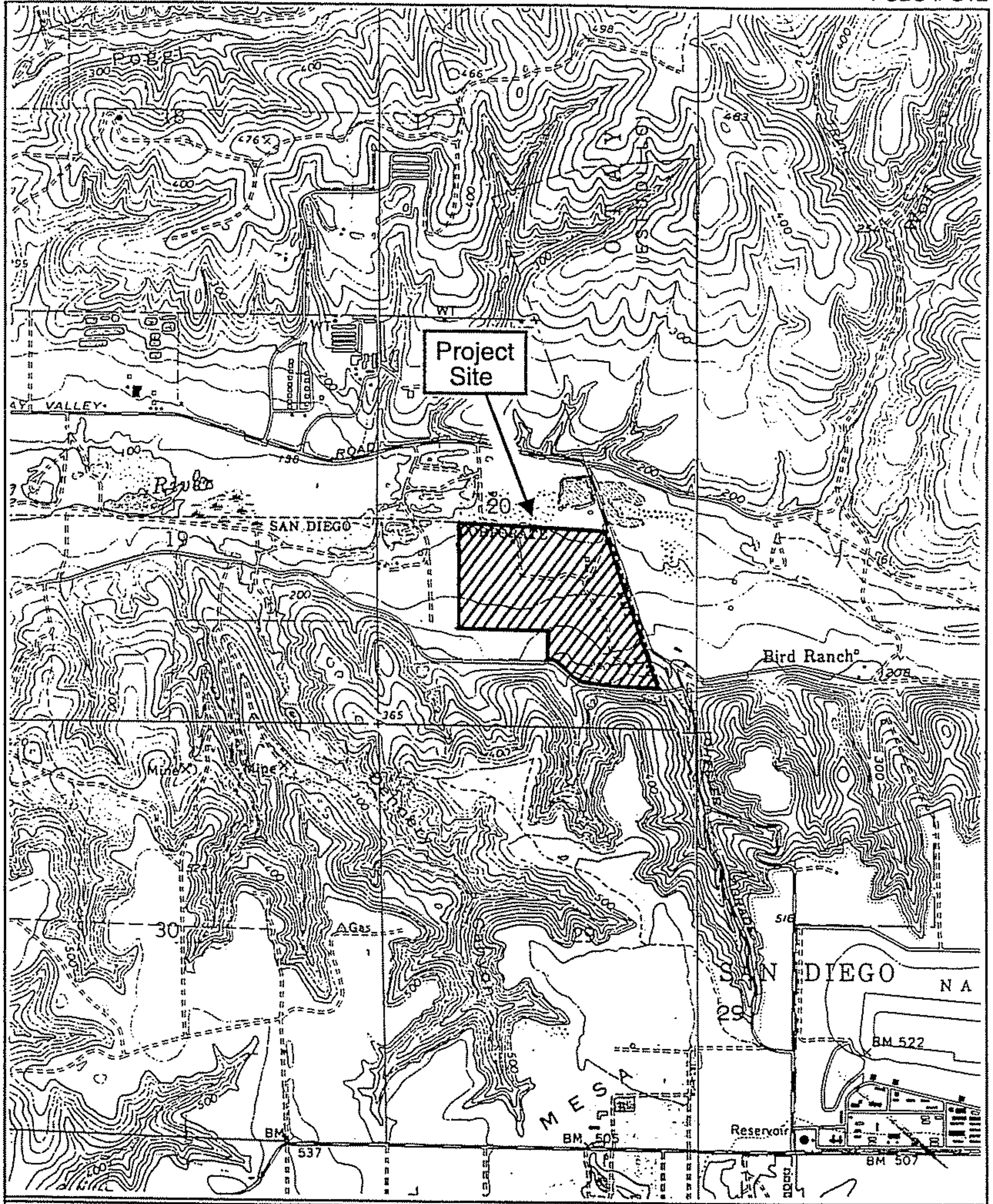



Figure 2. Project Vicinity Map
USGS 7.5' Imperial Beach and Otay Mesa Quadrangles

N
W E
S

1" = 2000'

*Pacific Southwest Biological Services, Inc.*

of the site are steep slopes and canyons rising to Otay Mesa. Further to the southeast is Brown Field. To the west of the site is more undeveloped land, most of which has also been used by motorcycle and other off-road vehicle activity. Further to the northwest, across Otay Valley Road, industrial and commercial facilities occur.

## 1.2 Project Description

The proposed project consists of the construction of a 20,000 person capacity outdoor amphitheater consisting of approximately 10,000 fixed seats and grass berms to provide lawn seating for an additional 10,000 patrons. Amphitheater construction would include a main stage, stagehouse structure, permanent one-story structures for ticket sales, concessions, restrooms, and first aid/medical station. The main stage would be at 20 feet below surface grade, and extend to a maximum height of 165 feet. Seating areas would include 10,000 fixed seats and open-lawn seating on landscaped berms. The amphitheater would have entrance plazas with concession facilities for access to and from parking lots with sloped ramps and walkways.

The amphitheater, as proposed, would be used for concert events ranging between 35-60 nights (occasionally in the day) per year and would generate typical noise associated with concerts. Fireworks may also accompany select performances. Additionally, an open air market (swap meet) is proposed for the parking lot area Thursday through Sunday from 7 am to 4 pm. The proposed project would require night lighting on-site (stage and parking lights) and along access roads.

Construction of the amphitheater would result in a change in topography and ground surface relief features as a seating berm approximately 50 feet above grade will be created in the northern portion of the site, sloping down to the stage which will be located approximately 20 feet below existing grade. The main stage and stagehouse structure will be located at the south side of the amphitheater, with the audience facing the south towards the stage.

The sloped berms of the amphitheater, entrances, and parking areas would be landscaped. The proposed amphitheater, roads, and parking areas would encompass all 72.5 acres of the project site. No natural open space areas are proposed on the project site. Off-site improvements have not been identified for project implementation. Primary access to the project site would be provided from access points along Otay Valley Road, with future potential access by way of Otay Rio Road and Spyglass Hill Road.

As indicated above, the amphitheater would operate an estimated 35-60 nights per year, and may generate as much as 6,000 automobile round trips for each full capacity event per year (estimated 8-9 events). Average capacity events are estimated to occur 40 times annually, primarily occurring in the evening. Average capacity events would generate approximately 3,000 automobile round trips. The open air market would generate a maximum of 2,500 automobile round trips per day, occurring Thursday through Sunday between the hours of 7 am and 4 pm.

## 1.3 PROJECT PURPOSE

The purpose of the proposed MCA Amphitheater project is to provide a large capacity outdoor amphitheater for entertainment, cultural, and civic events including concerts, plays, and dance performances, public speakers, and multi-media presentations for patrons from South San Diego County.

## 1.4 METHODS

Prior to initiating the field work, an in-house literature review was conducted by Pacific Southwest to gather background biological information relevant to the currently proposed project. This literature review included past projects located in the vicinity of Otay Valley including Otay Ranch, Otay Valley Road, and Otay Mesa. These documents are listed in Section VI of this report. A review of the Ca NDDB rarefind program was also conducted.

Field surveys of the botanical and zoological resources were conducted by W. Douglas Padley, Senior Wildlife Biologist, Claude G. Edwards, Ornithologist, Geoff Rogers, Staff Biologist, and Zak Likins, Botanist (Table 1). The on-foot surveys covered all slope aspects, soil types, and drainages on-site and in the general vicinity, including slopes south of the site, as well as adjacent habitats along the Otay River and on the slopes along Otay Valley Road, off-site to the north. The known locations of

**TABLE 1. SURVEY DATES & PERSONNEL**

| Date | Personnel | Hours | Field Conditions |
|---|---|---|---|
| 4/14/95 | ZHL CGE | 1500-1700 hours | Mostly-sunny; light westerly breezes; 65-70°F |
| 4/17/95 | WDP | 0900-1050 hours | Mostly-cloudy; light westerly breezes; ≈55°F. |
| 4/21/95 | CGE | 1430-1700 hours | Mostly-sunny; light westerly breezes; ≈66°F. |
| 4/23/95 | CGE | 0700-1145 hours | Clear & sunny; variable breezes; ≈70-74°F |
| 4/25/95 | CGE GLR | 1130-1510 hours | Hazy-sun; moderate south & west breezes; ≈70-76° |

**CGE=Claude G. Edwards, WDP=W. Douglas Padley, GLR=Geoffrey L. Rogers, ZHL=Z. Hunter Likins* previously noted sensitive flora and fauna were mapped on a 1" = 400' topographic map (Figure 3). No sensitive plant or wildlife species were observed on-site (footprint) during the current survey effort.

Five site visits were made between April 14, 1995 and April 25, 1995 (Table 1). The on-foot survey covered all slope aspects, soil types, and drainages. Vegetation and previously recorded sensitive resource locations were delineated on a 1" = 400' topographic map. The study area primarily included the 72.5 acre Amphitheater site footprint and all appropriate California Gnatcatcher habitat situated within 440 feet of the site. All habitat types present within the study area were surveyed for wildlife. Binoculars of 8 power or greater were used to observe and help in the identification of wildlife species and their habitats. Surface litter such as fallen logs, rocks and trash were overturned to locate amphibians and/or reptiles. Attention was also given to the identification of mammal tracks, scat or other sign. Listening for wildlife vocalizations was also an important aspect of data gathering.

Focused surveys were conducted for Coastal California Gnatcatchers (*Polioptila californica californica*) in specified areas surrounding the project site which contain appropriate habitat. These surveys were conducted under an Endangered Species Act Incidental Take Permit (Section 10(a), permit number PRT# 778100). In general, the surveys followed the U.S. Fish and Wildlife Service's recommended survey protocol; however, the interval between surveys was shortened because of a lack of suitable habitat, project planning and timing constraints, and the fact that the current survey effort was intended to re-verify already recorded data on this species. Previously conducted surveys in the project vicinity had already established the presence of this species in habitat adjacent to the project site.

Scientific nomenclature used in this report is from the following references: vegetation and general wildlife habitat delineations, Holland (1986) and Holstein, Jensen and Holland (1990); flora, Hickman (1993) and Beauchamp (1986); birds, American Ornithologists' Union (1983, 1989); reptiles and amphibians, Collins (1990); and mammals, Jones *et al.* (1992) and Hall (1981).

## 1.5 Survey Limitations

Complete biological inventories require a large number of field hours conducted over different seasons, weather conditions, and time of day. Depending on the season during which a field survey is conducted, amphibians, reptiles, many mammals, owls and other nocturnal birds, and annual plants are groups which can be difficult to inventory. Further, many species of wildlife are secretive in their behavior, restrict themselves to areas of dense vegetation, and/or occur in naturally low densities and can therefore be easily missed. Yearly variation of rainfall and requisite resources, which can be caused by drought or other factors, may result in population fluctuations. Over periods of time, this can lead to shifts in local or regional distribution patterns.

Despite these drawbacks, through literature review, study of museum records, and knowledge of the habitat requirements and distribution patterns of individual species, the probability of a given species being present on a site can be fairly accurately predicted. Unfortunately, species which are declining or have naturally patchy distribution patterns may not be present in areas of what appears to be suitable habitat. Thus, some animals must be surveyed at the proper season to determine the status of target species. This is especially true for annual plants, migratory birds, and many reptiles which are only active for part of the year.

Field surveys conducted in 1995 were focussed on issues related to Coastal California Gnatcatchers. The purpose of the field investigations was to update already known locations of this species and ascertain where additional approprate habitat existed south of the project site. Information for Least Bell's Vireo was gathered using existing information only. No surveys for this species were conducted as part of this project, as agreed to by both the City of Chula Vista and the California Department of Fish & Game.

Botanical resources were surveyed for within the project footprint only. Locations of sensitive plants known to occur in the project vicinity were mapped according to information obtained from the in-house literature search.

## 2.0 Results

Pacific Southwest has previously conducted four biological surveys in the immediate vicinity of the proposed MCA Amphitheater (1987, 1988, 1989, and 1993). Twenty-one sensitive plant species and seven sensitive vertebrate species were identified as occurring or potentially occurring within the vicinity of the proposed project. Four vegetation types occur within the vicinity of Otay Valley Road, three of which occur onsite.

## 2.1 Botanical Resources

### 2.1.1 Vegetation

The proposed MCA Amphitheater site supports three vegetation types: Disturbed, Coastal Sage Scrub, and Non-native Grasslands. Immediately north and adjacent to the site is a mixed Mule Fat-Southern Willow-Tamarisk Scrub vegetation type of the Otay River flood plain (Figure 3).

**Disturbed** vegetation encompasses most of the proposed project site. It is most prevalent on building pads and other areas where the ground has been bladed or disturbed by heavy machinery. The vegetation is composed of non-native species such as Fennel (*Foeniculum vulgare*), Garland Chrysanthemum (*Chrysanthemum coronarium*), Wild Lettuce (*Lactuca sericola*), mustards (*Brassica nigra, Hirschfeldia incana, Sisymbrium* sp.), Russian Thistle (*Salsola tragus*), Burclover (*Medicago polymorpha*), Yellow Sweetclover (*Melilotus officinalis*), and Red-stemmed Filaree (*Erodium cicutarium*). Larger woody plants such as Tree Tobacco (*Nicotiana glauca*), Castor Bean (*Ricinus communis*), and Tamarisk (*Tamarix* sp.) are also present. A small number of native plants have become established within the disturbed areas including Coyote Bush (*Baccharis pilularis*), Mule Fat (*Baccharis salicifolia*), and Broom Baccharis (*Bacharis sarothroides*), Blue Elderberry (*Sambucus mexicanus*), and Arroyo Willow (*Salix lasiolepis*). Several tree species have been planted within the Business Park including Peruvian Peppertree (*Schinus molle*), Chinese Weeping Elm (*Ulmus parvifolia*), Lilac Melaleuca (*Melaleuca decussata*), and Cajeput Tree (*Melaleuca quinquenervia*)

**Coastal Sage Scrub** is located on a cut slope immediately south of the site and along the northern boundary. The presence of sprinklers within this vegetation suggests it has been replanted. In addition, a patchwork distribution of principlally disturbed Coastal Sage Scrub elements occurs in portions of the southwest corner of the study area situated outside the project footprint. These scattered sage scrub elements are dominated by the presence of Lemonadeberry, with most other elements masked by the abundance of annual grasses and summer mustard. Although previously recorded in this area, no Coastal California Gnatcatchers were observed onsite and in other portions of the immediate project vicinity during the 1995 survey effort due to a lack of well developed and undisturbed vegetation, the

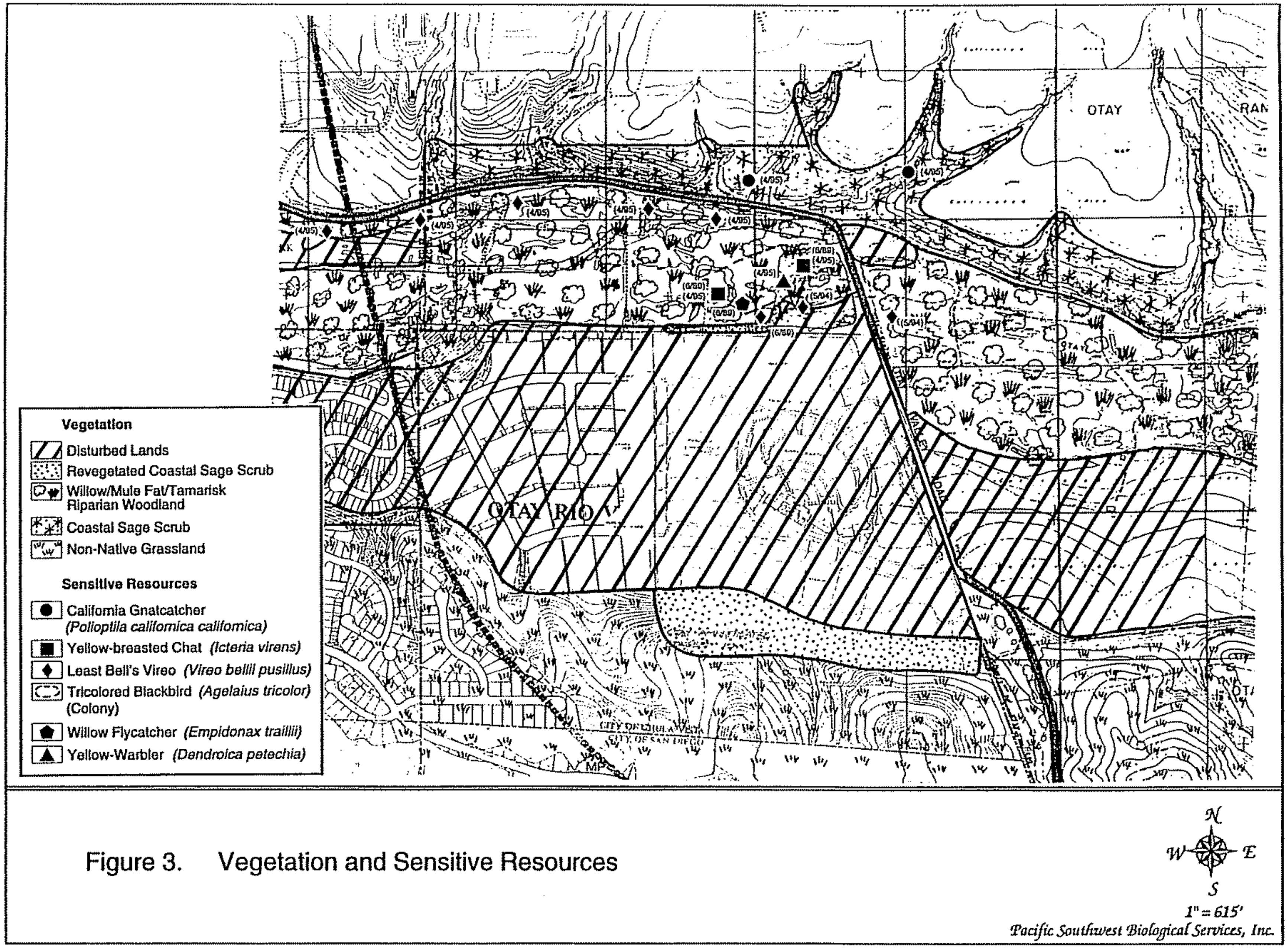



Figure 3. Vegetation and Sensitive Resources

predominance of non-native annuals, and the presence of abundant off-road activity and associated noise and human activity.

Plant species composing the Coastal Sage Scrub include Lemonadeberry (*Rhus integrifolia*), California Sagebrush (*Artemisia californica*), California Encelia (*Encelia californica*), Mule Fat, Toyon (*Heteromeles arbutifolia*), and Western Sycamore (*Platanus racemosa*). Additional patches of higher quality Coastal Sage Scrub containing Flat-topped Buckwheat (*Eriogonum fasciculatum*), and Deerweed (*Lotus scoparius*) are found north of Otay Valley Road.

**Non-native Grassland** dominates lands within surrounding the proposed site, particularly to the south and west. This vegetation type is composed of a variety of introduced grasses with a variety of forbes interspersed. Non-native grasses include Wild Oats (*Avena* sp.), Ripgut (*Bromus diandrus*), Soft Chess (*Bromus bordaceus*), Red Brome (*Bromus madritensis* ssp. *rubens*), Barley (*Hordeum* sp.), and Goldentop (*Lamarckia aurea*). Forb species present in the Non-native Grassland include mustards, Burclover, and Red-stemmed Filaree. Isolated within the Non-native Grassland are individual Jojoba (*Simmondsia chinensis*), Bladderpod (*Isomeris arborea*), and Mojave Yucca (*Yucca schidigera*). Lemonadeberry and Tree Tobacco form thickets within the Non-native Grasslands off-site.

### 2.1.2 FLORA

A total of 130 plant species were observed at the proposed MCA Amphitheater site; of these 49 were non-native (Appendix 1). The site's disturbed nature precluded the presence of a diverse native flora. No sensitive plants were found on the 72.5 acre amphitheater site; however five sensitive plant species were found in the immediate vicinity. The site's flora is typical of Non-native Grassland fields which are prevalent in the area.

## 2.2 ZOOLOGICAL RESOURCES

### 2.2.1 AMPHIBIANS

No amphibians were observed on-site, however, Western Toad (*Bufo boreas*), Pacific Chorus Frog (*Pseudacris regilla*), and Bullfrogs (*Rana catesbeiana*) are known from the area (PSBS 1989). Because the site has been graded and because there is a lack of debris for amphibians to seek shelter under few amphibians are expected to occur on-site. Any amphibians encountered on-site are probably associated with the Otay River.

### 2.2.2 Reptiles

The only reptile species observed was the Western Fence Lizard (*Sceloporus occidentalis*). Western Whiptails (*Cnemidophorus tigris*), Orange-throated Whiptails (*Cnemidophorus hyperythrus*), and Northern Red Diamond Rattlesnakes (*Crotalus ruber ruber*) are known from the area (PSBS 1989). Other species expected to occur on-site but not observed include Side-blotched Lizard (*Uta stansburiana*), Coronado Skink (*Eumeces skiltonianus interparietalis*), Southern Alligator Lizard (*Gerrhonotus multicarinatus*), Western Patch-Nosed Snake (*Salvadora hexalepis*), Gopher Snake (*Pitouphis melanoleucus*), Two-striped Garter Snake (*Thamnophis hammondii*), and the Southern Pacific Rattlesnake (*Crotalus viridis helleri*).

### 2.2.3 Birds

Approximately twenty-five species of birds were identified on-site, and an additional forty species were identified in the immediate vicinity and may be expected to use the site. The Disturbed vegetation provides cover and forage for a variety of birds. Mourning Dove (*Zenaida macroura*), Red-winged Blackbird (*Agelaius phoeniceus*), Tricolored Blackbird (*Agelaius tricolor*), Western Meadowlark (*Sturnella neglecta*), House Finch (*Carpodacus mexicanus*), and Lesser Goldfinch (*Carduelis psaltria*) were common. Cliff Swallow (*Hirundo pyrrhonota*) and Northern Rough-winged Swallow (*Stelgidopteryx serripennis*) were conspicuous aerial feeders. A Loggerhead Shrike (*Lanius ludovicianus*) was observed hunting from trees and light standards.

In the Non-native Grassland and small patches of Coastal Sage Scrub located south and west of the project site, several species of birds were observed. Flocks of House Finches and Lesser Goldfinches were common, Bewick's Wren (*Thryomanes bewickii*), Wrentit (*Chamaea fasciata*), California Towhee (*Pipilo crissalis*), Blue Grosbeak (*Guiraca caerulea*) and Anna's Hummingbird (*Calypte anna*) were heard calling. A Greater Roadrunner (*Geococcyx californianus*) was observed along the southern boundary of the site. Although Coastal California Gnatcatchers were recorded in this area previously within the southern and western portions of the study area, this species was not observed or detected in this area during the current survey effort, most likely due to a lack of adequate habitat and the amount of disturbance to remaining, scattered sage scrub elements, as well as disturbance (habitat fragmentation and noise) due to off-road vehicle activity.

Along the northern boundary of the site California Quail (*Callipepla californica*), Mourning Dove, Anna's Hummingbird, Northern Rough-winged Swallow (*Stelgidopteryx serripennis*), Cliff Swallow, Bushtit (*Psaltriparus minimus*), Common Yellowthroat (*Geothlypis trichas*), California Towhee, Song Sparrow (*Melospiza melodia*), and American Goldfinch (*Carduelis tristis*) were observed. Also present but not as conspicuous were Black Phoebe (*Sayornis nigricans*), Bewick's Wren, Orange-crowned Warbler (*Vermivora celata*), Wilson's Warbler (*Wilsonia pusilla*), and Black-headed Grosbeak (*Pheucticus melanocephalus*). Also known from the area but not observed on-site are the Least Bell's Vireo, Yellow Warbler (*Dendroica petechia*), and Yellow-breasted Chat (*Icteria virens*).

#### 2.2.4 Mammals

Four species of mammals were observed on-site. The California Ground Squirrel (*Spermophilus beecheyi*), Black-tailed Jackrabbit (*Lepus californicus*), Desert Cottontail (*Sylvilagus audubonii*), and Botta's Pocket Gopher (*Thomomys bottae*) are relatively common on-site. Although not observed the Coyote (*Canis latrans*), Gray Fox (*Urocyon cinereoargenteus*), Raccoon (*Procyon lotor*), mice (*Peromyscus* sp.) and woodrats (*Neotoma* sp.) are known from the area (PSBS 1989).

## 2.3 Sensitive Biological Resources

### 2.3.1 Sensitive Plants Located Within the Study Area But Not Present On-site

To assess the value of the floristic associations on-site, a search was conducted to identify key species of plants occurring in each habitat. Listed below are seven sensitive plant species known from the immediate vicinity of the proposed project.

*San Diego Barrel Cactus* [*Ferocactus viridescens* (T. & G.) Britton & Rose]

| | | |
|---|---|---|
| **LISTING:** | CNPS List 2<br>State/Fed. Status – /C2<br>Global Rank G4 State Rank S3.1 | R-E-D Code 1-3-1<br>CACTACEAE May-Jun. |
| **DISTRIBUTION:** | Coastal San Diego County; Baja California, Mexico | |
| **HABITAT:** | The optimal habitat for this cactus appears to be Diegan Sage Scrub hillsides; often at the crest of slopes and growing in cobbles. It occasionally is found on the periphery of vernal pools and mima mound topography at Otay Mesa, sometimes in considerable numbers. This presumably more mesic habitat (Stockpen gravelly clay loams) is unlike the very xeric situations where it is typically found. This barrel cactus utilizes a number of other soil types such as San Miguel-Exchequer rocky silt loams and Redding gravelly loams. | |
| **STATUS:** | San Diego Barrel Cactus is declining, but still grows at many locales. Once very common along the coast, many small and mid-sized populations are routinely being impacted by grading for urban development. Particularly hard hit are the once vigorous colonies on Otay Mesa. Substantial portions of all sizeable populations should be protected. | |

The local population of Coast Barrel Cactus occurs in small, relatively dense clusters on the slopes and mesas north of Otay Mesa Road within the undisturbed Coastal Sage Scrub. Conditions at this locality appear to be ideal and this population may be one of the more concentrated which occur along the coastal slope of San Diego County.

*Otay Tarplant* [*Hemizonia conjugens* Keck]

**LISTING:** CNPS List 1B R-E-D Code 3-3-2
State/Fed. Status – CE/C2 ASTERACEAE May-Jun.
Global Rank G1 State Rank S1.1

**DISTRIBUTION:** Southern San Diego County; Baja California, Mexico

**HABITAT:** Fractured clay soils in grasslands or lightly vegetated Diegan Sage Scrub are the preferred habitat of the Otay Tarplant. Most of the sites near Sweetwater Reservoir are mapped as Diablo clay. Usually there is little competition from woody shrubs where this annual grows.

**STATUS:** Otay Tarplant is substantially declining; most sites are endangered by residential development. It is strongly recommended the State of California take stronger action to protect this species from urban pressures. This species should be given strong consideration for Federal Endangered status; the current status as State Endangered has not adequately protected this species. Sympatric presence of the closely related *Hemizonia paniculata* within the very limited range of *Hemizonia conjugens* is considered questionable despite old reports which place the latter at nearby locales (Paradise Valley, 2 miles east of San Ysidro, Spring Valley, and Telegraph Canyon). More taxonomic work is needed. *H. paniculata* is abundant in western Riverside County where it grows in various soil types in xeric sage scrub; it is not restricted to clays. It is uncommon in northern San Diego County south to near Barham Road in San Marcos. *H. conjugens* is restricted to cracking clay soils generally devoid of woody shrubs. It often grows interdigitated but not sympatrically with *Hemizonia fasciculata*, the common tarweed of the region, at locales where "fingers" of clay intrude into loams. Taking into account that population numbers at single sites may be very high even within relatively confined areas, it is recommended that substantial portions of all populations of Otay Tarplant should be protected and placed into dedicated biological open space.

This highly-localized species was found within the Coastal Sage Scrub habitat on the hillsides north of Otay Valley Road. Although they were not in bloom during the 1995 survey, approximately 500 plants were identified during a previous survey (PSBS 1989) situated along a fenceline through the vegetation.

*San Diego Marsh Elder* [*Iva hayesiana* Gray]

**LISTING:** CNPS List 2 R-E-D Code 2-2-1
State/Fed. Status –/C2 ASTERACEAE Apr.-Sep.
Global Rank G3? State Rank S3?

**DISTRIBUTION:** San Diego County; Baja California, Mexico

**HABITAT:** Creeks or intermittent streambeds are the preferred habitat for this low-growing, conspicuous shrub. It is rarely situated on seeps near creeks. Typically, the riparian canopy is open allowing for substantial sunlight to reach the marsh elder. Sandy alluvial embankments with cobbles are frequently utilized. Within the southwestern portion of the County this plant may occur in steep watercourses where other riparian vegetation is not present. While soils are usually mapped as Riverwash, these steeper locales can include various series including San Miguel-Exchequer or Huerhuero loams.

**STATUS:** San Diego Marsh Elder is considered stable but potentially affected by modifications and degradation of coastal drainages in San Diego County. It is a rather aggressive shrub which could expand its range if introduced into coastal creeks where it is not presently found. Substantial portions of sizeable populations should be protected.

San Diego Marsh-Elder was found to be widespread and conspicuous, a major component of the brushy understory vegetation within the Otay River floodplain. The Otay River has been described as having the heaviest concentration os this species in San Diego County.

*Ashy Spike-moss* [*Selaginella cinerascens* A. A. Eat.]

**LISTING:** CNPS List 4 — R-E-D Code 1-2-1
State/Fed. Status -- None — SELAGINELLACEAE March
Global Rank G4G5 State Rank S3S4

**DISTRIBUTION:** San Diego, Orange counties; Baja California, Mexico

**HABITAT:** Undisturbed chaparral and Diegan Sage Scrub are often utilized by this prostrate perennial groundcover. It is a good indicator of site degradation as it rarely inhabits disturbed soils. Many soil types are utilized with Redding cobbly loam apparently an optimal soil type near Miramar.

**STATUS:** Ashy-footed Spike-moss is substantially declining due to urban expansion along the coast. Nevertheless, it still occurs at several thousand locales, and is not recommended for CNPS listing.

Numerous plants were widespread on the hard clay soil within the Coastal Sage Scrub habitat north of Otay Valley Road.

*San Diego County Viguiera [Viguiera laciniata* **Gray in Torr.]**

**LISTING:** CNPS List 4 — R-E-D Code 1-2-1
State/Fed. Status -- None — ASTERACEAE Feb.-Jun.
Global Rank G4 State Rank S3.2

**DISTRIBUTION:** San Diego County, Baja California, Mexico

**HABITAT:** An arid Diegan Sage Scrub is typically the preferred habitat of this species, which is often a co-dominant element of the shrub community where it occurs, along with *Artemisia californica*. Generally the shrub cover is more open than at mesic, coastal locales where sage scrub is found. This species occurs on a variety of soil types. Olivenhain cobbly loam is mapped for the large populations of *Viguiera* at Lower Otay Lake and Sweetwater Lake; Las Posas fine sandy loam and Cieneba very rocky coarse sandy loam are utilized at some sites further inland such as near Sequan Indian Reservation.

**STATUS:** San Diego Viguiera is declining but still found at many hundreds of locales where occasionally it is a dominant shrub. This species shows some ability to colonize areas of mild disturbance and is readily grown from seed. This species is recommended for de-listing by the CNPS; it is too common and wide-ranging in San Diego County to warrant such a listing.

The San Diego County Viguiera is a conspicuous and dominant member of the Coastal Sage Scrub plant community on the hillsides north of Otay Valley Road. Although its range is limited to San Diego County and northern Baja, it occurs over an extensive area within its range.

*California Adolphia* [*Adolphia californica* Wats.]

**LISTING:** CNPS List 2 — R-E-D Code 1-2-1
State/Fed. Status -- None — RHAMNACEAE Dec.-Apr.
Global Rank G3 State Rank S2.1

**DISTRIBUTION:** Coastal San Diego County; Baja California, Mexico

**HABITAT:** This short shrub is often intermixed with Diegan Sage Scrub, but occasionally occurs in peripheral chaparral habitats, particularly hillsides near creeks. The California Adolphia (sometimes called California Spinebush) is usually associated with *Eriogonum fasciculatum* and *Artemisia californica* in xeric locales where shrub canopy reaches four or five feet in height. During late summer and fall it may be virtually leafless, and therefore not apparent from a distance; however, its spiny stems are readily noted at close range. The San Miguel and Friant soils are both quite amenable to California Adolphia.

**STATUS:** California Adolphia is substantially declining due to urban growth; still healthy populations are extant. This spiny shrub is sometimes a dominant shrub on hillsides, and such sites should be protected. Although *Adolphia* is not uncommon in southwestern San Diego County, a decade of continued urbanization along the coast could significantly reduce the populations now extant. California Adolphia should be considered for native revegetation projects in suitable habitat.

*Western Dichondra* [*Dichondra occidentalis* House]

**LISTING:** CNPS List 4 — R-E-D Code 1-2-1
State/Fed. Status -- /C3c — CONVOLVULACEAE Mar.-May
Global Rank G3 State Rank S3.2

**DISTRIBUTION:** Sonoma and Marin counties (questionable) disjunct to San Barbara County south and along the coast to Baja California.

**HABITAT:** Southern Mixed Chaparral, Diegan Sage Scrub, rocky outcrops in grasslands, and especially recently exposed areas of post-burn habitat are all sometimes occupied by this small, cryptic perennial herb. It often grows almost completely hidden at the base of leafy shrubs. Soil tolerances for *Dichondra* appear variable with Loamy alluvial land of the Huerhuero complex utilized at Torrey Pines, Hambright gravelly clay loam in the San Onofre Mountains, and a variety of other types elsewhere.

**STATUS:** Western Dichondra is slowly declining in coastal Southern California and is a borderline species for inclusion on the CNPS list. Sites with very high densities are noteworthy; in such circumstances substantial portions of these populations should be protected.

### 2.3.2 SENSITIVE VERTEBRATES DETECTED OR KNOWN TO OCCUR IN THE PROJECT VICINITY

The location of the project site is situated where certain habitats are known to support sensitive species of animals, notably birds. These are relatively easy to detected by their active behavior and vocalizations. Ten sensitive species of birds and one sensitive species of mammal were observed utilizing the site.

*Birds*

**White-tailed Kite** (*Elanus leucurus*)

**LISTING:** CDFG (1992) - Special Animal
CDFG (1991) - Fully Protected

**DISTRIBUTION:** Central Valley and coastal California; extensions north into Oregon and south into northern Baja California, Mexico. Northeastern mainland Mexico populations often extend north into the United States.)

**HABITAT:** Grasslands, agricultural fields, occasionally shrublands of California's coastal valleys and plains. Marshes and grassy bottomlands where large clumps of trees are adjacent to foraging habitat are favored sites for winter roosts.

**STATUS:** The centers of abundance for these raptors in southern California are the coastal valleys and plains of San Diego, Orange, and western Riverside counties, which are the areas which are currently undergoing large-scale and rapid habitat conversion due to residential development. While historic population fluctuations have made their present status difficult to determine, the numbers of breeding individuals are thought to be declining locally in some areas, and wintering populations may be diminishing as well due to loss of winter foraging habitat and roost sites.

At least one pair of White-tailed Kites have been observed foraging over the riparian vegetation and non-native grasslands off-site. They are believed to breed in the vicinity and were observed performing courtship behavior and vocalizing. A Kite was observed harassing a Red-tailed Hawk (*Buteo jamaicensis*), indicating a nest may be near by.

**Northern Harrier** (*Circus cyaneus*)

| | |
|---|---|
| **LISTING:** | CDFG (1992) - Species of Special Concern |
| **DISTRIBUTION:** | Widespread across North America, but a very localized breeder. |
| **HABITAT:** | Coastal Salt Marsh, Freshwater Marsh, grasslands, and agricultural fields. |
| **STATUS:** | This raptor has greatly declined as a breeder in southern California due to loss of habitat. |

A male harrier was repeatedly seen soaring above the project site from the grasslands on the steep slopes south of the site to the sage scrub habitat north of the site. It was observed being harassed by Red-winged Blackbirds (*Agelaius phoeniceus*) along the Otay River.

**Southwestern Willow Flycatcher** (*Empidonax traillii extimus*)

| | |
|---|---|
| **LISTING:** | USFWS (1995c) - Endangered<br>CDFG (1993) - Endangered |
| **DISTRIBUTION:** | Southwest United States and northwest Mexico. |
| **HABITAT:** | Summer resident only; breeds in willow riparian woodland. |
| **STATUS:** | Seriously declining subspecies. |

An individual of this migratory species was reported previously (PSBS 1989) from the Mule Fat-Southern Willow-Tamarisk scrub vegetation along the Otay River. It was not observed on-site and is not expected to breed in the vicinity of the proposed project.

**Coastal California Gnatcatcher** (*Polioptila californica californica*)

| | |
|---|---|
| **LISTING:** | USFWS (1993) - Threatened<br>CDFG (1992) - Species of Special Concern |
| **DISTRIBUTION:** | Currently occurs in San Diego, Riverside, and Orange counties south to Baja California, Mexico. Has been extirpated from Ventura, Los Angeles, and San Bernardino counties. |
| **HABITAT:** | Diegan and Riversidean Sage Scrub. Also occurs in Maritime Succulent Scrub, and less commonly in open chaparral. |
| **STATUS:** | Seriously declining due to loss of habitat. Between 85% and 90% of this species' habitat has been lost to urban or agricultural development. It has already been extirpated from the counties of Ventura, San Bernardino, and most of Los Angeles. The United States population is estimated to be between 1,200 and 2,000 pairs (Atwood 1990). The California subspecies (*P.c. californica*) has a very narrow coastal range in Baja California, Mexico from the United States border south to the vicinity of El Rosario. San Diego County appears to be the center of abundance within the United States for this species. |

As reported in a previous survey (PSBS 1989) two occupied territories were located in good quality Coastal Sage Scrub habitat north of Otay Valley Road. No adequate habitat was found which could support this species south of the site.

**Loggerhead Shrike** (*Lanius ludovicianus*)

| | |
|---|---|
| LISTING: | CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Occurs throughout the United States, south-central Canada and northern Mexico. The northern populations are migratory. |
| HABITAT: | Open country with scattered trees or other perch sites. |
| STATUS: | Apparently continuing to decline throughout its range (Graham 1990), possibly due to pesticides and/or other factors. Resident populations are augmented by an influx of wintering individuals in the fall. |

This predatory songbird was observed hunting from exotic trees and light standards on-site, as well as from a patch of Coastal Sage Scrub off-site to the south. The shrike is an uncommon year-round resident which utilizes a variety of habitats throughout San Diego County.

**Least Bell's Vireo** (*Vireo bellii pusillus*)

| | |
|---|---|
| LISTING: | USFWS (1993) - Endangered<br>CDFG (1993) - Endangered |
| DISTRIBUTION: | Southern California; Baja California Norte, Mexico. |
| HABITAT: | Riparian Woodland. |
| STATUS: | Stable/declining due to habitat destruction and nest parasitism by the Brown-headed Cowbird (*Molothrus ater*). |

As many as five occupied breeding territories are present along the south side of Otay Valley Road in taller vegetation within the Mule Fat-Southern Willow-Tamarisk scrub. They have been noted nearer to the site within this habitat previously (PSBS 1989) but there is insufficient cover to attract them and protect potential nest sites.

**Yellow Warbler** (*Dendroica petechia*)

| | |
|---|---|
| LISTING: | CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Formerly widespread breeder in riparian habitats throughout California. |
| HABITAT: | Riparian woodland, generally with tall and mature canopy. |
| STATUS: | Declined dramatically in many areas due to destruction of riparian woodland and population explosion of Brown-headed Cowbirds (*Molothrus ater*). |

Although quite common as a migrant, and somewhat less common as a breeding species in riparian areas, a single individual was detected as it sang from along the Otay River north of the site.

**Yellow-breasted Chat** (*Icteria virens*)

| | |
|---|---|
| LISTING: | CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Formerly widespread breeder in riparian habitats throughout California. |
| HABITAT: | Riparian woodland/scrub with dense undergrowth. |
| STATUS: | Once fairly common in riparian habitats throughout California. At present it is much less common, especially in southern California due to habitat destruction. |

Two territorial singing Yellow-breasted Chats were found to be present in dense vegetation along the Otay River north of the project area.

**Coastal Rufous-crowned Sparrow** (*Aimophila ruficeps canescens*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Coastal southern California from Santa Barbara County south into Baja California, Mexico. |
| HABITAT: | Sparse, low scrub, often mixed with grasses on rocky slopes. California Sagebrush (*Artemisia californica*) is often present in scrub inhabited by this sparrow. |
| STATUS: | Uncommon to fairly common but localized resident. |

Three Rufous-crowned Sparrows were seen, in an isolated patch of Coastal Sage Scrub on a steep slope dominated by Non-native Grassland, south of the project area.

**Tricolored Blackbird** (*Agelaius tricolor*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Endemic to California and small area of extreme southern Oregon. |
| HABITAT: | Breeds in large colonies in extensive fresh water marshes. During winter forages widely in cultivated lands and on lawns. |
| STATUS: | Unknown. Believed to be declining due to habitat loss. |

A probable breeding colony of approximately 100 to 200 pairs was located along the Otay River north of the site. Small flocks were observed flying back and forth over a large area in the vicinity, including the project, to forage in disturbed and not-native grassland.

*Mammals*

**San Diego Black-tailed Jackrabbit** (*Lepus californicus bennettii*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Coastal population from Point Conception - Mount Piños east to Pasadena, western Anza-Borrego Desert, Jacumba south to San Quintín Baja California, Mexico. |
| HABITAT: | Generally found in open or semi-open country. Thick chaparral and forested habitats are unsuitable. |
| STATUS: | Declining. |

A single individual was spooked from the dense weedy vegetation of the graded building pads on-site.

### 2.3.3 Sensitive Animals Potentially Occurring But Not Found On-site

It often takes repeated visits to a site to properly survey it for all of the expectable sensitive species which may occur. Based on the vegetation, physiography and species biology the following species, while not observed, are potentially present on-site.

*Amphibians*

**Western Spadefoot** (*Spea hammondi*)

| | |
|---|---|
| LISTING: | CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Mostly Central Valley, bordering foothills and Coast Ranges south of San Francisco Bay into northwestern Baja California, Mexico. |
| HABITAT: | Primarily found in the lowlands (below 3,000 feet), frequenting washes, river floodplains, alluvial fans, playas, alkali flats, and ranges into the foothills and mountains. Prefers sandy or gravelly soil in grasslands, sage scrub, open chaparral, and pine-oak woodlands. |
| STATUS: | Found in isolated populations in southern California. Populations are declining. |

**Arroyo Southwestern Toad** (*Bufo microscaphus californicus*)

| | |
|---|---|
| LISTING: | USFWS (1994b) - Endangered<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Coast Range from near Santa Margarita, San Luis Obispo County, south into northwestern Baja California, Mexico; Transverse Mountains. Desert population along Mojave River in San Bernardino County. |
| HABITAT: | Found in washes, streams and arroyos in semi-arid lowlands. Prefers sandy banks with willows, cottonwoods, or sycamores. |

STATUS: Not well known; appears to be uncommon with a spotty distribution; much of its former habitat, sandy river floodplains, has been disturbed. South of Ventura, only a dozen or so extant populations have been recently documented. The expansion of non-native, predatory Bullfrogs (*Rana catesbeiana*) is a probable factor in the decline of Arroyo Toads.

*Reptiles*

**Southwestern Pond Turtle** (*Clemmys marmorata pallida*)

LISTING: USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern
CDFG (1991) - Fully Protected

DISTRIBUTION: This subspecies, *C. m. pallida*, occurs from the Monterey area south into Baja California, Mexico.

HABITAT: Highly aquatic, prefers ponds, creek pools, and marshes with rocky or muddy bottoms.

STATUS: Declining. In southern California, i.e., Los Angeles County south, this turtle is becoming quite rare due to the general destruction of lowland riparian areas and human disturbance. The expansion of non-native, predatory fish and Bullfrogs (*Rana catesbeiana*) are additional probable factors in the decline of Southwestern Pond Turtles.

**Coronado Skink** (*Eumeces skiltonianus interparietalis*)

LISTING: USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern

DISTRIBUTION: Found in northwest Baja California, Mexico including Coronado Islands north into Los Angeles County, California.

HABITAT: Occurs in a variety of habitats including grasslands, sage scrub, and pine-oak forests. Often found beneath logs, leaf litter, and other surface debris.

STATUS: Limited in range but still common.

**Orangethroat Whiptail** (*Cnemidophorus hyperythrus beldingi*)

LISTING: USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern

DISTRIBUTION: Limited; found from southern Orange, western Riverside, and San Diego counties south to southern Baja California, Mexico.

HABITAT: Open woodlands, sage scrub, chaparral, and along the edges of riparian zones and washes.

STATUS: This species is still relatively common in areas where good habitat occurs; however, vast areas of former habitat in the coastal lowlands have been converted to urban and agricultural development.

**Coastal Whiptail** (*Cnemidophorus tigris multiscutatus*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2 |
| DISTRIBUTION: | Santa Barbara County southward through the northern two-thirds of Baja California, Mexico. |
| HABITAT: | Open sage scrub, chaparral, open woodlands and bordering areas, along the edges of riparian zones and washes, desert and semi-arid habitats. |
| STATUS: | This species is still relatively common in areas where good habitat occurs; however, vast areas of former habitat in the coastal lowlands have been converted to urban and agricultural development. |

**Coast Patchnose Snake** (*Salvadora hexalepis virgultea*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | South Central Coast Ranges, south into northwest Baja California, Mexico. |
| HABITAT: | Occurs in scrublands including sage scrub and chaparral where lizards especially whiptails (*Cnemidophorus*), a favored prey item, are common. |
| STATUS: | Uncommonly encountered, abundance is not well known. |

**Two-striped Garter Snake** (*Thamnophis hammondi*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Special Animal<br>CDFG (1991) - Sensitive |
| DISTRIBUTION: | Coastal California and northwest Baja California, Mexico. |
| HABITAT: | Along creeks, rivers, freshwater marshes, and vernal pools. |
| STATUS: | Once common in southern California; at present, appears to be declining due to habitat disturbance. Predation of young snakes by Bullfrogs (*Rana catesbeiana*) and non-native fish may also affect population levels. |

**Northern Red Diamond Rattlesnake** (*Crotalus ruber ruber*)

| | |
|---|---|
| LISTING: | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| DISTRIBUTION: | Within its United States range, this species is confined primarily to the Peninsular Ranges. Red Diamond Rattlesnakes are found from extreme southern Los Angeles County and Morongo Valley south into Baja California, Mexico. |
| HABITAT: | Frequents rocky outcrops in chaparral, sage scrub or desert scrub on both coastal and desert slopes, usually below 1219 meters. |
| STATUS: | Still fairly common where extensive areas of habitat remain. This and other species of rattlesnakes are frequently persecuted by humans. This species is considered sensitive because of its limited United States range. |

*Birds*

**Western Least Bittern** (*Ixobrychus exilis hesperis*)

**LISTING:** USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern

**DISTRIBUTION:** Common throughout midwestern and eastern United States. Western population occurs from southeastern Oregon through California and into Mexico. In California, occurs in scattered populations in Siskiyou and Modoc counties, the Central Valley, southern coastal areas, Salton Sea and the Colorado River.

**HABITAT:** Dense emergent wetlands and desert riparian habitats. Coastal populations need source of fresh water nearby.

**STATUS:** Breeding populations have declined throughout the west. Principle cause of decline is believed to be habitat destruction.

**California Horned Lark** (*Eremophila alpestris actia*)

**LISTING:** USFWS (1994a) - Category 3C
CDFG (1992) - Species of Special Concern

**DISTRIBUTION:** Several subspecies of Horned Larks occur throughout North America. Although several other subspecies are reported to occur and may breed in San Diego County, *E.a. actia* is reported to be the most common on the coastal slope.

**HABITAT:** Sandy shores, bare ground, grassland, open agricultural land, and open scrubland.

**STATUS:** Common breeding resident, abundant migrant and winter visitor in southern California.

**Bell's Sage Sparrow** (*Amphispiza belli belli*)

**LISTING:** USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern

**DISTRIBUTION:** Coastal slope sage scrub and chaparral in California.

**HABITAT:** Sage scrub and chaparral.

**STATUS:** Declining. This race has patchy distribution locally in sage scrub and sometimes in chamise chaparral. Generally found only in large habitat blocks.

*Mammals*

**Pallid Bat** (*Antrozous pallidus*)

**LISTING:** CDFG (1992) - Species of Special Concern

**DISTRIBUTION:** Found throughout California with the exception of the northwest portion of the state and the higher elevations of the Sierra Nevada Mountains above 6000 feet.

**HABITAT:** Occupies a variety of habitats. These relatively large bats typically feed on large terrestrial arthropods. The coastal subspecies prefers grassland and oak woodlands for foraging. Roosts in crevices in trees, rocks, and buildings.

**Status:** Declines in the coastal population are due to loss of foraging habitat.

**California Mastiff Bat** (*Eumops perotis californicus*)

**Listing:** USFWS (1994a) - Category 2
CDFG (1990, 1991, 1992) - Species of Special Concern
**Distribution:** Central California to Central Mexico.
**Habitat:** Rugged, rocky areas.
**Status:** Unknown. This species is currently known from only two roosting sites in California, both in San Diego County (Pat Brown, Brown-Berry Biological Consulting, pers. comm. 1993); however, there are undoubtedly others which have not been discovered to date.

**Dulzura California Pocket Mouse** (*Chaetodipus californicus femoralis*)

**Listing:** USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern
**Distribution:** Coastal southern California from the north of the Santa Margarita River, north to Temecula, south to Aguanga, Dulzura, and on into Baja California, Mexico.
**Habitat:** Sage scrub and chaparral habitats.
**Status:** Unknown.

**Northwestern San Diego Pocket Mouse** (*Chaetodipus fallax fallax*)

**Listing:** USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern
**Distribution:** San Onofre north to Claremont, northeast to Banning, then south to Jacumba and on into Baja California to San Quentin, Mexico.
**Habitat:** Coastal sage scrub.
**Status:** Unknown, possibly declining due to extensive urban and agricultural development.

**Southern Grasshopper Mouse** (*Onychomys torridus ramona*)

**Listing:** USFWS (1994a) - Category 2
CDFG (1992) - Species of Special Concern
**Distribution:** Southern third of California, occurring on both the coastal and desert sides of the mountains.
**Habitat:** Occurs in a variety of habitats including scrublands, chaparral, riparian areas, and desert.
**Status:** Declining. Localized population.

**San Diego Desert Woodrat** (*Neotoma lepida intermedia*)

| | |
|---|---|
| **LISTING:** | USFWS (1994a) - Category 2<br>CDFG (1992) - Species of Special Concern |
| **DISTRIBUTION:** | Coastal southern California and Baja California from San Luis Obispo south to San Bernardino Mountains, Redlands, and continuing south through Julian and Dulzura and on into Baja California, Mexico to the Sierra San Pedro Matir. A disjunct population also is reported from the Porterville area in Tulare County. |
| **HABITAT:** | Sage scrub and chaparral, often associated with rock outcrop. |
| **STATUS:** | Unknown, but believed to be declining due to loss of habitat. |

# 3.0 Potential Project Impacts

## 3.1 Direct Impacts

No significant direct impacts to biological resources are anticipated from the construction and operation of the proposed MCA Amphitheater project. Construction activities, which include the amphitheater itself, associated parking lots, and access roads would result in the loss of approximately 72.5 acres of primarily disturbed vegetation. Because the proposed project is located within a previously disturbed (graded and landscaped) business park, there would be no disturbance or displacement of native habitat or sensitive plant or wildlife resources as a result of project implementation.

No direct impacts to Coastal Sage Scrub vegetation or California Gnatcatchers are anticipated as a result of project implementation. Coastal Sage Scrub habitat present on slopes to the north and south on-site appear to be the direct result of a previous revegetation effort associated with the former Otay Rio Business Park project, as evidenced by the observation of sprinkler heads in these areas. As well, based upon the conceptual grading plan provided, this habitat is not expected to be affected by grading or construction activities.

No direct impacts to riparian habitat or individual Least Bell's Vireos situated within the Otay River floodway are anticipated as a result of implementation of the MCA project. Based upon the conceptual site plan provided, this habitat is not expected to be affected by grading or construction of any off-site activities.

The proposed project would result in a loss of raptor, songbird, and small mammal foraging areas, as the site would be covered with either permanent structures or impervious surfaces (parking lots). Open, grassy areas planned on-site would compensate for some of the potential foraging area loss, as these planned areas would attract the common small mammals and rodents typically sought out by predatory birds such as red-tailed hawks and kites. The loss of foraging habitat, however, is not considered important biologically as abundant open-space lands exist in surrounding areas. Although two sensitive bird species (Loggerhead Shrike and Tri-colored Blackbird) currently use the site on occasion, they are expected to remain in the area and continue using adjacent habitats following project construction and operation.

## 3.2 Indirect Impacts

Although loss of habitat is considered to be the most significant direct impact associated with species extirpations, indirect impacts to biological resources may also result in species loss. A number of factors may contribute to the loss of the Least Bell's Vireo and California Gnatcatchers from the project vicinity. In general, interaction of several factors can undoubtedly result in some, if not many, extirpations; therefore, the exact cause of species loss from an area is often not readily discernable, except where substantial habitat loss occurs.

Included among indirect impacts are disturbance factors such as noise, dust, lighting/glare, and human activity (encroachment). Of these potential factors, human activity due to operation and maintenance of the proposed MCA Amphitheater and associated activities (swap meet and fireworks displays) is expected to have the greatest potential for impact to sensitive resources in the project vicinity, particularly the riparian habitat of the Otay River Valley.

Short-term increased noise levels resulting from concerts are unlikely to have a significant impact on California Gnatcatchers in the project vicinity due to the proximity of suitable habitat and the fact that this habitat already experiences high noise levels as a result of vehicle activity along Otay Valley Road and off-road vehicle activity in surrounding open space lands.

As well, such short-term impacts are unlikely to significantly affect Least Bell's Vireo nesting in the project vicinity because of this species' migratory habit and its principal activity time during the early morning and daylight hours when mating, foraging, vocalization, and nest building activity occurs. Although occasional fireworks displays may cause additional noise-related stress for both these species, the potential risk from wildfires sparked by these events posses a larger potential threat. However, discussions with local fire officials (Joe Monaco/City of Chula Vista personal communication to Zak Likins/PSBS) indicate that fireworks displays are strictly controlled and supervised and, therefore would not pose a significant potential fire threat to the species or its habitat.

In addition, other potential indirect impacts such as human encroachment, nighttime lighting and glare, and fugitive trash may also be detrimental to sensitive species in the immediate vicinity. Riparian bird species living along and within the Otay River floodway are most susceptible to these disturbance factors and may abandon nest sites in the future, depending upon the amount and duration of these types of disturbances.

### 3.2.1 NOISE

*California Gnatcatchers*

Few studies have been conducted on the effects of noise levels on the California Gnatcatcher. Furthermore, is often difficult to distinguish the effects of noise from the effects of other associated natural or man-made activities. Studies which have been performed have been short-term observational studies with limited behavioral, ecological, or noise monitoring. Work which has been completed, however, when in combination with incidental observational data, suggest that California Gnatcatchers occupy areas with both high and low ambient noise levels.

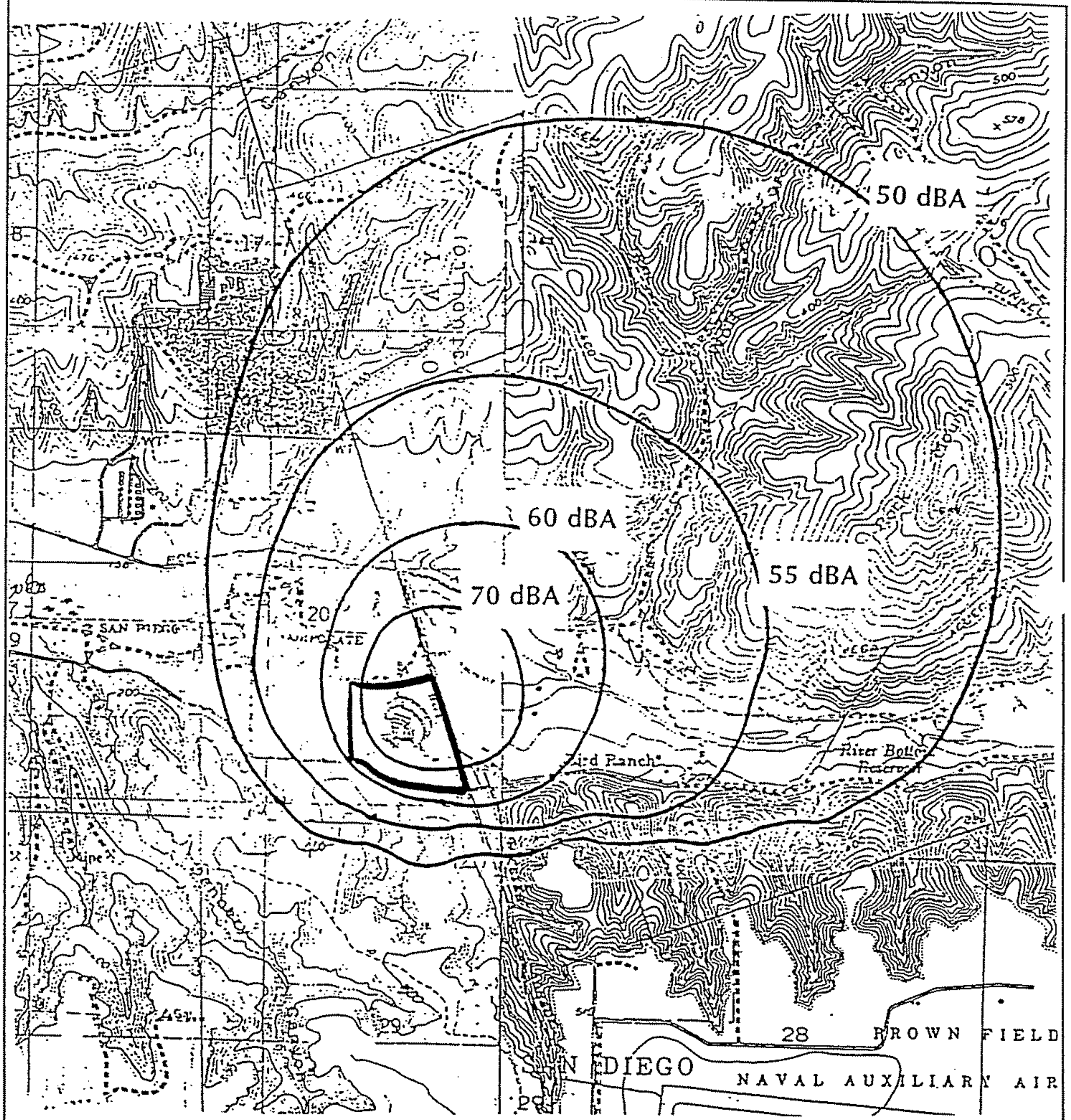
A number of California Gnatcatcher pairs occur within areas of extreme noise, including California gnatcatchers nesting within 1.5 meters of the pavement at Manchester Avenue in Encinitas, territories on the Sweetwater Valley (K. Merkel, pers. obs. 1993), adjacent to the Baxter Explosives rock quarry site (D. Mayer, J. Harris, pers. obs. 1992), adjacent to Interstate 805 near Rose Canyon (D. Mayer, pers. obs. 1993), and birds under flight paths of NAS Miramar (K. Merkel, pers. obs. 1993), and MCAS El Toro (D. Mayer, J. Harris, pers. obs. 1993).

Recent noise monitoring within California Gnatcatcher territories has been conducted at Nobel Drive in northern San Diego (PSBS 1994). Nighttime noise levels were within the middle 40's dB CNEL while daytime levels were frequently between 60 and 70 CNEL, with spikes up to 78 dB (Giroux and Associates/Pacific Southwest Biological Services, unpublished data). These data would suggest that birds can tolerate relatively high noise levels for prolonged periods. Unfortunately, such data do not allow for an evaluation of ecological costs of this tolerance, in the long term, if any. Figure 4 provides estimated noise level contours which compare similarly to those stated above.

Short-term noise impacts such as those associated with construction activities would be expected to have less effect than prolonged noise exposure. Behavioral monitoring conducted on waterbirds within the San Dieguito Lagoon during the Del Mar Grand Prix (PSBS 1988) failed to reveal any significant modification of bird behavior or distribution as a result of noise levels averaging as high as 70dB levels before the race. Where activities accompanied noise (i.e., pedestrian, vehicular, and low-flying aircraft traffic), birds frequently flushed causing a temporary short-term disruption of normal activity patterns. Similar responses have been noted on a more incidental basis with California Gnatcatchers occurring at the sites listed above.

Where noise generating activities are visually or spatially isolated from birds, normal activities appear to be little affected by noise. This is based upon observations of birds in proximity to the studies mentioned above. Where noise has been accompanied by "threatening activities," birds have responded by behavior modification, such as cessation of breeding activity and potential nest abandonment. Irrespective of the existing information, it is generally recognized the principal period of concern when birds stand to be most affected by such disturbances is during the nesting season (February 1 through August 15).

Concern has been raised in the past, however, about the sudden introduction of noise into areas that were previously quiet and whether established pairs are displaced or disturbed by a sudden increase in ambient noise levels. Given the fact that the project vicinity already experiences high noise levels due to existing off-road vehicle activity on a daily basis, it is unlikely the occasional increased noise levels generated by the MCA project and associated activities would significantly affect California




Source: Wrighton, Johnson, Haddon & Williams, Inc.

Figure 4. Predicted Amphitheater Noise Contours

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*Pacific Southwest Biological Services, Inc.*

Gnatcatchers utilizing the already fragmented habitat located north of Otay Valley Road more than 400 yards away.

*Least Bell's Vireo*

Impacts of noise on the Least Bell's Vireo result from two distinct causes; the perceived quality of a bird's call and the distance a bird's call can be heard. This can result in two effects. First, impaired hearing could result from exposure to potential increases in noise levels. This could range from deafness of individual birds to minor shifts in the auditory threshold within different frequencies audible to the species. These physiologic responses could affect the birds ability to detect the presence of predators, hear alarm calls, or distinguish between potential or existing mates, thereby potentially lowering that birds fitness. As well, increases in noise levels may effectively reduce the perceived quality of the male's call and lead to a lack of mating as a result of altered/poor mate selection, again reducing the overall fitness of an individual bird. These effects could result from masking of the male's song, altering its character, or reducing the distance over which it can be heard (RECON, 1988).

Noise levels above 110 dB are known to cause physical damage to the auditory system of most vertebrates. Changes in auditory threshold associated with extremely high noise levels may cause psychological irritability as well as reducing ability to protect territory and/or find mates. Lower levels of noise may effect the vireo as well. Impacts from noise vary with the intensity of noise exposure. The effects of exposure to chronic low noise levels may cause subtle behavioral changes as well.

Continuous noise levels above 60 dB within habitat areas may affect the suitability of the area for vireo nesting. Caltrans surveys observed a continuously high noise level (61 dBA Leq) at one sample nest site (RECON, 1988). Subsequent studies and observations have indicated that vireos will nest in areas of higher noise levels, although it is not known what ecological costs, if any, are borne by these birds. Given the fact that the project vicinity already experiences high noise levels due to existing off-road vehicle activity on a daily basis, it is unlikely the occasional increased noise levels generated by the MCA project and associated activities would significantly affect the Least Bell's Vireo utilizing this portion of the Otay River Valley.

### 3.2.2 LIGHTING

Increased lighting can also have a negative effect on wildlife. Many species use darkness to avoid predators. Increased lighting in the area may allow for incidental increases in predation by both domestic animals and other native predators. In lieu of the fact that site specific lighting information is currently unavailable, potential lighting impacts cannot be assessed in detail. In general, however, such sporadic, limited-use lighting would be expected to have only a minor, localized affect on sensitive species and habitats adjacent to the project site, provided normal screened lighting is used and illumination/glare is shielded and projected into the project site and away from the surrounding native habitat. Stringent lighting standards would need to be developed to ensure potential impacts are minimized to the degree feasible, without jeopardizing public safety concerns.

### 3.2.3 DUST

Although little is known concerning the effects of noise on California Gnatcatchers, even less is known about the impacts of habitat dusting. It is presumed that birds may be indirectly affected by heavy dusting of vegetation which may effect insect prey densities. If, in fact, dust generation adversely affects California gnatcatchers, this is expected to be most pronounced during the late summer and fall seasons when insect prey densities and rainfall events are at their lowest (Roach 1989) and dust generation potential is at its highest level. During the late summer and fall seasons California gnatcatchers are less territorial and utilize larger home ranges which suggests a greater ability to forage in areas less affected by dust. Dust may have greater effects on young nestlings or fledglings than on adults; however, this has not been documented.

In lieu of the fact that the project vicinity already experiences substantially high dust levels resulting from off-road activities, nearby mineral extraction operations, and local, solid waste management operations, few if any dusting impacts beyond those present already are anticipated as a result of project implementation.

### 3.2.4 HUMAN ACTIVITIES (ENCROACHMENT)

Potential impacts of the proposed project resulting from human encroachment are expected to occur. The presence of humans and their domesticated animals can result in higher levels of predation, habitat degradation, nest site loss or abandonment, nest parasitism, and behavioral disturbances (Atwood 1990). Human encroachment may increase the density of predators on passerine birds. Of particular concern is the introduction of domestic cats which have been shown to be a major predator on wildlife in general and birds in particular. Predation and nest parasitism in California Gnatcatchers was reviewed and it was suggested that nest predation by human pets may result in significant losses (Atwood 1990). Much of the information is anecdotal in nature; however, due to the prevalence of predation at the nest, extensive independent substantiation of particular predators has not occurred.

Where human access is available, a progressive degradation of the habitat generally ensues. Fragmented habitats, in proximity to urban developments, are more susceptible to degradation. The project site currently receives heavy recreational use by bicycles, motorcycles, and other off-road vehicle users. Large areas of sage scrub habitat present on the south slopes of the Otay River Valley east of

Interstate 805 have been stripped of vegetation by prolonged abuse by recreational enthusiasts, including the slopes and hills on land adjacent to the project site.

The MCA project would likely draw thousands of people to the site annually, principally on weekend days for the open air market or swap meet. Because daytime use of the area would increase significantly, there is a higher potential for humans to wander into and disturbed adjacent riparian habitat of the Otay River Valley. The additional potential physical presence of humans within this sensitive habitat could alter nesting and foraging habits of the Least Bell's Vireo. Although this impact may be minimal initially, it is expected that long-term potential impacts may result as individuals attending concert events and the swap meet, in particular, could disrupt adjacent riparian habitat of the Otay River through progressive degradation to understory vegetation. However, these long-term potential impacts cannot be predicted with any certainty.

## 4.0 Recommended Mitigation Measures

Potential short-term project construction and operations noise impacts would not result in prolonged adverse effects to local or regional California Gnatcatcher or Least Bell's Vireo populations. Limited information suggests that short-term construction activity noise may alter behavior of these species in adjacent habitats but is unlikely to result in permanent abandonment of an area. Such indirect impacts as noise can be attenuated or eliminated through on-site measures including, but not limited to, the following:

**Noise**

1) Construction should be restricted to the non-nesting season for both species (1 September - 1 February). However, if this is not possible, focused monitoring for the presence of vireos is recommended during the construction period. Should vireos occur within the proximity of construction, noise levels should be restricted to 60 dB or less at the territory edge prior to 11:00 am. After 11:00 am, construction work may occur within the defined work area (project footprint).
2) Construction disturbances which are non-site specific, such as staging areas, should be allowed only within the project footprint.
3) To reduce potential noise, as well as lighting impacts, an earthen berm should be constructed along the northern edge of the MCA Amphitheater project site to deflect both light and noise upward, away from the Otay River floodway.
4) A Least Bell's Vireo monitoring program should be conducted within this reach of the Otay River Valley for a period of 5 years as a part of the mitigation plan. This monitoring can be limited to collection of existing information from other on-going projects in the project vicinity.

**Lighting**

5) Provide stringent lighting standards to ensure potential impacts are minimized to the greatest degree feasible, without jeopardizing public safety concerns, including use of normal screened lighting to ensure illumination/glare is shielded and projected into the project site and away from the surrounding native habitat. Use low pressure sodium lights, if feasible.

**Dust**

6) To reduce the potential for dusting impacts, "Best Management Practices" and standard dust control measures should be used.

**Human Encroachment**

7) A fence or decorative barrier should be constructed along the northern edge of the MCA Amphitheater site or around the parking lot areas to discourage and reduce use of the riparian habitat within the Otay River floodway.

**Other Recommendations**

8) All exposed slopes situated adjacent to surrounding native habitat should be reseeded with a locally appropriate coastal sage scrub seed mix during the first wet season following construction to discourage exotics from invading nearby native habitats.

9) Urban runoff shall be directed away from the Least Bell's Vireo habitat located to the north, unless runoff is filtered through specifically designed sediment and grease trap storm drains which can be cleared and cleaned annually.

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# APPENDIX 1

## FLORAL CHECKLIST OF SPECIES OBSERVED ON-SITE OR IN THE PROJECT VICINITY

# APPENDIX 1. FLORAL CHECKLIST OF SPECIES OBSERVED ON-SITE OR IN THE PROJECT VICINITY

Habitat Key: D = Disturbed, G = Non-Native Grassland, S = Coastal Sage Scrub, R = Willow/Mule Fat/Tamarisk

| SCIENTIFIC NAME/COMMON NAME | HABITAT |
|---|---|
| **CRYPTOGAMS** | |
| **Selaginellaceae** - Spike-Moss Family | |
| *Selaginella bigelovii* Underw. Bigelow's Mossfern | S |
| *Selaginella cinerascens* A.A. Eat. Ashy Spike-moss | S |
| **DICOTYLEDONS** | |
| **Anacardiaceae** - Sumac Family | |
| *Rhus integrifolia* (Nutt.)Benth. & Hook. Lemonadeberry | S |
| *Rhus ovata* Wats. Sugar Bush | D |
| * *Schinus molle* L. Peruvian Pepper Tree | D |
| *Toxicodendron diversilobum* (Torrey & Gray)Greene Western Poison Oak | R |
| **Apiaceae** - Carrot Family | |
| * *Conium maculatum* L. Common Poison Hemlock | R |
| *Daucus pusillus* Michx. Rattlesnake Weed | S |
| * *Foeniculum vulgare* Mill. Fennel | D |
| **Apocynaceae** - Dogbane Family | |
| * *Vinca major* L. Greater Periwinkle | D |
| **Asteraceae** - Sunflower Family | |
| *Ambrosia confertiflora*(DC.) Rydb. Weak-leaf Burbush | S |
| *Artemisia californica* Less. California Sagebrush | S |
| *Baccharis salicifolia* (R. & P.)Pers. Mule Fat | R, D |
| *Baccharis sarothroides* Gray Broom Baccharis | R, D |
| *Brickellia californica* (Torrey & Gray)Gray California Brickellbush | R |
| * *Centaurea melitensis* L. Tocalote | S, R, D, G |
| * *Chamomilla suaveolens* (Pursh.)Ryd. Pineapple Weed | R |
| * *Conyza canadensis* (L.)Cronq. Horseweed | D |
| *Encelia californica* Nutt. California Encelia | S |
| *Eriophyllum confertiflorum* (DC.)Gray var. *confertiflorum* Golden-yarrow | S |
| *Filago californica* Nutt. California Filago | S |
| * *Filago gallica* L. Narrow-leaf Filago | S |
| *Gnaphalium bicolor* Bioletti Bicolor Cudweed | R |
| *Gnaphalium californicum* DC. California Everlasting | S |
| *Gnaphalium luteo-album* L. Cudweed | S, D |
| *Gutierrezia sarothrae* (Pursh)Britt. & Rusby Matchweed | S |
| * *Hedypnois cretica* (L.)Willd. Crete Hedypnois | S, D, G |
| *Hemizonia conjugens* Keck Otay Tarplant | S |
| *Hymenoclea monogyra* Gray Desert Fragrance | R |
| * *Hypochoeris glabra* L. Smooth Cat's-ear | S, D, G |
| *Isocoma menziesii* (Hook. & Arn.)Nesom var. *vernonioides* (Nutt.)Nesom Coastal Goldenbush | S |
| *Iva hayesiana* Gray San Diego Marsh-Elder | R |
| * *Lactuca serriola* L. Wild Lettuce | D |
| *Lasthenia californica* Lindley Common Goldfields | S |
| *Osmadenia tenella* Nutt. Osmadenia | S |
| *Rafinesquia californica* Nutt. California Chicory | S |
| * *Silybum marianum* (L.)Gaertn. Milk-thistle | R |

| | | |
|---|---|---|
| * | *Sonchus oleraceus* L. Common Sow Thistle | R |
| | *Viguiera laciniata* Gray San Diego County Viguiera | S |
| * | *Xanthium strumarium* L. Cocklebur | R |

**Boraginaceae** - Borage Family

| | | |
|---|---|---|
| | *Amsinckia menziesii* (Lehm.)Nelson & J.F. Macbr. var. *intermedia* (F. & M.)Ganders Rancher's Fireweed | S |
| | *Cryptantha intermedia* (Gray)Greene Nievitas, Cryptantha | S |

**Brassicaceae** - Mustard Family

| | | |
|---|---|---|
| * | *Brassica nigra* (L.)Koch Black Mustard | D, G |
| * | *Hirschfeldia incana* (L.)Lagr.-Fossat Short-pod Mustard | D, G |
| * | *Raphanus sativus* L. Radish | D |
| * | *Rorippa nasturtium-officinale* (L.)Hayek Water Cress | R |
| * | *Sisymbrium officinale* (L.)Scop. Hedge Mustard | D |

**Cactaceae** - Cactus Family

| | | |
|---|---|---|
| | *Ferocactus viridescens* (Nutt.)Britton & Rose San Diego Barrel Cactus | S |
| | *Mammillaria dioica* K. Bdg. Fish-hook Cactus | S |
| | *Opuntia littoralis* (Engelm.)Ckll. Coast Prickly-pear | S |
| | *Opuntia prolifera* Engelm. Cholla | S |

**Capparaceae** - Caper Family

| | | |
|---|---|---|
| | *Isomeris arborea* Nutt. Bladderpod | S |

**Caprifoliaceae** - Honeysuckle Family

| | | |
|---|---|---|
| | *Sambucus mexicana* DC. Blue Elderberry | S, D |

**Caryophyllaceae** - Pink Family

| | | |
|---|---|---|
| * | *Silene gallica* L. Common Catchfly | S, G, D |

**Chenopodiaceae** - Goosefoot Family

| | | |
|---|---|---|
| * | *Chenopodium* sp. | D |

**Cistaceae** - Rock-Rose Family

| | | |
|---|---|---|
| * | *Cistus incanus* L. Purple Rock-rose | D |

**Convolvulaceae** - Morning-Glory Family

| | | |
|---|---|---|
| | *Calystegia macrostegia* (Greene)Brumm. ssp. *tenuifolia* (Abrams)Brumm. Narrow-leaf Morning-glory | S |
| | *Dichondra occidentalis* House Western Dichondra | S |

**Crassulaceae** - Stonecrop Family

| | | |
|---|---|---|
| | *Crassula connata* (Ruiz & Pav.)Berger Dwarf Stonecrop | S |
| | *Dudleya edulis* (Nutt.)Moran Ladies-fingers | S |
| | *Dudleya pulverulenta* (Nutt.)Britt. & Rose Chalk-lettuce | S |

**Cucurbitaceae** - Gourd Family

| | | |
|---|---|---|
| | *Marah macrocarpus* (Greene)Greene var. *macrocarpus* Cucamonga Manroot, Wild-Cucumber | S |

**Euphorbiaceae** - Spurge Family

| | | |
|---|---|---|
| * | *Ricinus communis* L. Castor-bean | D |

**Fabaceae** - Pea Family

| | | |
|---|---|---|
| * | *Acacia redolens* Creeping Acacia | D |
| | *Astragalus trichopodus* ssp. *leucopsis* (Torrey & Gray)Thorne Locoweed | S, R |
| | *Lotus scoparius* (Nutt.)Ottley var. *scoparius* Coastal Deerweed | S |
| | *Lupinus bicolor* Lindl. Miniature Lupine | S |
| | *Lupinus succulentus* Koch Arroyo Lupine | S, G |
| * | *Medicago polymorpha* L. California Burclover | D, G |

| | |
|---|---|
| * *Melilotus officinalis* (L.)Lam. Yellow Sweetclover | S, D, G, R |
| **Fagaceae** - Oak Family | |
| *Quercus agrifolia* Neé Coast Live Oak | D |
| **Geraniaceae** - Geranium Family | |
| * *Erodium botrys* (Cav.)Bertol. Long-beak Filaree | D, G |
| * *Erodium cicutarium* (L.)L'Hér. Red-stem Filaree | D, G, R |
| **Hydrophyllaceae** - Waterleaf Family | |
| *Emmenanthe penduliflora* Benth. Whispering Bells | S |
| *Phacelia cicutaria* Greene var. *hispida* Gray Caterpillar Phacelia | S |
| **Lamiaceae** - Mint Family | |
| * *Marrubium vulgare* L. Horehound | R, D, G |
| * *Mentha spicata* L. var. *spicata* Spearmint | D |
| *Salvia apiana* Jeps. White Sage | S |
| **Malvaceae** - Mallow Family | |
| * *Malva parviflora* L. Cheeseweed, Little Mallow | D |
| **Myrtaceae** - Myrtle Family | |
| * *Melaleuca decussata* Lilac Melaleuca | D |
| * *Melaleuca quinquenervia* Cageput Tree | D |
| **Nyctaginaceae** - Four-O'Clock Family | |
| *Mirabilis californica* Gray California Wishbone Plant | S |
| **Papaveraceae** - Poppy Family | |
| *Eschscholzia californica* Cham. California Poppy | S |
| **Platanaceae** - Sycamore Family | |
| *Platanus racemosa* Nutt. Western Sycamore | S, R |
| **Polemoniaceae** - Phlox Family | |
| *Linanthus dianthiflorus* Greene Ground Pink | S |
| *Navarretia atractyloides* (Benth.)Greene Holly-leaf Skunkweed | S |
| **Polygonaceae** - Buckwheat Family | |
| *Eriogonum fasciculatum* Benth. var. *fasciculatum* Flat-top Buckwheat | S |
| * *Rumex crispus* L. Curly Dock | D |
| **Primulaceae** - Primrose Family | |
| * *Anagallis arvensis* L. Scarlet Pimpernel | S, R, G, D |
| **Rhamnaceae** - Buckthorn Family | |
| *Adolphia californica* Wats. California Adolphia | S |
| **Rosaceae** - Rose Family | |
| *Heteromeles arbutifolia* (Ait.)M. Roem. Toyon | S, D |
| **Rubiaceae** - Madder Family | |
| *Galium angustifolium* Nutt. ex Torrey & Gray ssp. *angustifolium* Narrow-leaf Bedstraw | S |
| * *Galium aparine* L. Goose Grass | S |
| **Salicaceae** - Willow Family | |
| *Populus fremontii* Wats. ssp. *fremontii* Fremont Cottonwood | R |
| *Salix gooddingii* Ball Goodding's Black Willow | R |
| *Salix lasiolepis* Benth. Arroyo Willow | R, D |

| | |
|---|---|
| **Scrophulariaceae** - Figwort Family | |
| *Antirrhinum nuttallianum* DC. ssp. *subsessile* (Gray)Thompson Nuttall's Snapdragon | S |
| *Mimulus aurantiacus* Curtis San Diego Monkeyflower | S |
| *Penstemon spectabilis* Gray Showy Penstemon | S |
| **Simmondsiaceae** - Jojoba Family | |
| *Simmondsia chinensis* (Link)C.K. Schneid. Jojoba | S |
| **Solanaceae** - Nightshade Family | |
| *Datura wrightii* Regel Western Jimsonweed | R |
| *Lycium andersonii* Gray Waterjacket | S |
| * *Nicotiana glauca* Grah. Tree Tobacco | R, D, G |
| **Tamaricaceae** - Tamarisk Family | |
| * *Tamarix* sp. Tamarisk | R, D |
| **Urticaceae** - Nettle Family | |
| * *Urtica urens* L. Dwarf Nettle | D, G |
| **Verbenaceae** - Verbena Family | |
| *Verbena lasiostachys* Link var. *lasiostachys* Western Vervain | S |
| **MONOCOTYLEDONS** | |
| **Cyperaceae** - Sedge Family | |
| *Scirpus californicus* (C.A. Mey.)Steudel. California Bulrush | R |
| **Iridaceae** - Iris Family | |
| *Sisyrinchium bellum* Wats. Blue-eyed-grass | S |
| **Juncaceae** - Rush Family | |
| *Juncus acutus* L. ssp. *leopoldii* (Parl.)Snag. Spiny Rush | R |
| **Liliaceae** - Lily Family | |
| *Bloomeria crocea* (Torr.)Cov. Common Goldenstar | S |
| *Calochortus splendens* Benth. Splendid Mariposa | S |
| *Dichelostemma capitatum* Wood ssp. *capitatum* Wild Hyacinth | S |
| *Yucca schidigera* Ortgies Mojave Yucca | S |
| **Poaceae** - Grass Family | |
| * *Arundo donax* L. Giant Reed | R |
| * *Avena fatua* L. Wild Oat | S, R, D, G |
| *Bothriochloa barbinodis* (Lag.)Herter Cane Bluestem | S |
| * *Bromus diandrus* Roth Ripgut Grass | S, R, D, G |
| * *Bromus hordeaceus* L. Soft Chess | D, G |
| * *Bromus madritensis* L. ssp. *madritensis* Compact Chess | S, R, D, G |
| * *Cortaderia selloana* (Scholtes)Asch. & Graebner Pampas Grass | R, D |
| * *Gastridium ventricosum* (Gouan)Schinz & Thell. Nit Grass | S |
| *Hordeum* sp. Barley | D,C |
| * *Lamarckia aurea* (L.)Moench Golden-top | S, R, D, G |
| *Melica imperfecta* Trin. Coast Range Melic | S |
| *Muhlenbergia microsperma* (DC.)Kunth Littleseed Muhly | S |
| *Nassella lepida* (A.S. Hitchcock)Barkworth Foothill Needlegrass | S |
| *Nassella pulchra* (A.S. Hitchcock)Barkworth Purple Needlegrass | S |
| * *Pennisetum setaceum* Forsk. Fountain Grass | S, R, D |
| **Typhaceae** - Cat-Tail Family | |
| *Typha domingensis* Pers. Southern Cattail | R |

* - Denotes non-native plant taxa

# Appendix 2

## Animals Observed or Detected On-Site or In the Project Vicinity

## APPENDIX 2. ANIMALS OBSERVED OR DETECTED ON-SITE OR IN THE PROJECT VICINITY

Habitat Key: D = Disturbed, G = Non-Native Grassland, S = Coastal Sage Scrub, R = Willow/Mule Fat/Tamarisk

| COMMON NAME | SCIENTIFIC NAME | NUMBER | HABITAT |
|---|---|---|---|
| **REPTILES** | | | |
| **Phrynosomatidae** | | | |
| Western Fence Lizard | *Sceloporus occidentalis* | 6 | D |
| **BIRDS** | | | |
| **Ardeidae** (Herons and Bitterns) | | | |
| Snowy Egret | *Egretta thula* | 1 | R |
| Cattle Egret | *Bubulcus ibis* | 1 | R |
| **Anatidae** (Swans, Geese, and Ducks) | | | |
| Mallard | *Anas platyrhynchos* | 4 | R |
| Cinnamon Teal | *Anas cyanoptera* | 6 | R |
| Ruddy Duck | *Oxyura jamaicensis* | 6 | R |
| **Cathartidae** (American Vultures) | | | |
| Turkey Vulture | *Cathartes aura* | 1 | F, S |
| **Accipitridae** (Hawks, Old World Vultures, and Harriers) | | | |
| White-tailed Kite | *Elanus leucurus* | 2 | F, R, G |
| Northern Harrier | *Circus cyaneus* | 2 | G, F |
| Red-tailed Hawk | *Buteo jamaicensis* | 2 | F |
| **Phasianidae** (Quails, Pheasants, and Relatives) | | | |
| California Quail | *Callipepla californica* | 30 | D, S, R |
| **Rallidae** (Rails, Gallinules, and Coots) | | | |
| American Coot | *Fulica americana* | 4 | R |
| **Charadriidae** (Plovers and Relatives) | | | |
| Killdeer | *Charadrius vociferus* | 6 | D, R |
| **Columbidae** (Pigeons and Doves) | | | |
| Mourning Dove | *Zenaida macroura* | 25 | D, S, R, G |
| **Cuculidae** (Typical Cuckoos) | | | |
| Greater Roadrunner | *Geococcyx californianus* | 2 | S, G |
| **Trochilidae** (Hummingbirds) | | | |
| Black-chinned Hummingbird | *Archilochus alexandri* | 1 | R |
| Anna's Hummingbird | *Calypte anna* | 15 | D, S, R |
| Rufous Hummingbird | *Selasphorus rufus* | 1 | R |
| **Tyrannidae** (Tyrant Flycatchers) | | | |
| Black Phoebe | *Sayornis nigricans* | 6 | D, R, G |
| **Hirundinidae** (Swallows) | | | |
| Northern Rough-winged Swallow | *Stelgidopteryx serripennis* | 35 | F, R, G, D |
| Cliff Swallow | *Hirundo pyrrhonota* | 15 | F, R, G, S, D |

| | | | |
|---|---|---|---|
| **Corvidae** (Jays, Magpies, and Crows) | | | |
| Common Raven | *Corvus corax* | 4 | F, R |
| **Aegithalidae** (Bushtit) | | | |
| Bushtit | *Psaltriparus minimus* | 35 | D, S, R |
| **Troglodytidae** (Wrens) | | | |
| Bewick's Wren | *Thryomanes bewickii* | 8 | S, R |
| **Muscicapidae** (Old World Warblers, Gnatcatchers, Kinglets, Thrushes, Bluebirds, and Wrentit) | | | |
| California Gnatcatcher | *Polioptila californica californica* | 3 | S |
| Wrentit | *Chamaea fasciata* | 10 | S, R |
| **Mimidae** (Mockingbirds and Thrashers) | | | |
| Northern Mockingbird | *Mimus polyglottos* | 6 | D, S, R |
| California Thrasher | *Toxostoma redivivum* | 8 | S, R |
| **Laniidae** (Shrikes) | | | |
| Loggerhead Shrike | *Lanius ludovicianus* | 2 | D, G |
| **Vireonidae** (Typical Vireos) | | | |
| Least Bell's Vireo | *Vireo bellii pusillus* | 6 | R |
| Solitary Vireo | *Vireo solitarius* | 2 | R |
| Warbling Vireo | *Vireo gilvus* | 3 | R |
| **Emberizidae** (Warblers, Sparrows, Blackbirds and Relatives) | | | |
| Orange-crowned Warbler | *Vermivora celata* | 10 | D, S, R |
| Yellow Warbler | *Dendroica petechia* | 1 | R |
| Yellow-rumped Warbler | *Dendroica coronata* | 4 | R |
| Black-throated Gray Warbler | *Dendroica nigrescens* | 1 | R |
| MacGillivray's Warbler | *Oporornis tolmiei* | 2 | S |
| Common Yellowthroat | *Geothlypis trichas* | 30 | S, R |
| Wilson's Warbler | *Wilsonia pusilla* | 6 | R |
| Yellow-breasted Chat | *Icteria virens* | 2 | R |
| Black-headed Grosbeak | *Pheucticus melanocephalus* | 8 | R, G |
| Blue Grosbeak | *Guiraca caerulea* | 4 | R, G |
| Lazuli Bunting | *Passerina amoena* | 8 | S, G |
| Rufous-sided Towhee | *Pipilo erythrophthalmus* | 6 | S, R |
| California Towhee | *Pipilo crissalis* | 10 | S, R, G |
| Rufous-crowned Sparrow | *Aimophila ruficeps* | 3 | S |
| Song Sparrow | *Melospiza melodia* | 65 | R |
| Lincoln's Sparrow | *Melospiza lincolnii* | 2 | R |
| White-crowned Sparrow | *Zonotrichia leucophrys* | 6 | R |
| Red-winged Blackbird | *Agelaius phoeniceus* | 200 | D, R, G |
| Tricolored Blackbird | *Agelaius tricolor* | 150 | D, R, G |
| Western Meadowlark | *Sturnella neglecta* | 8 | D, R, G |
| Brown-headed Cowbird | *Molothrus ater* | 4 | R |
| Hooded Oriole | *Icterus cucullatus* | 2 | R |
| Northern Oriole | *Icterus galbula* | 6 | D, S, R |
| **Fringillidae** (Finches) | | | |
| House Finch | *Carpodacus mexicanus* | 55 | D, S, R, G |
| Lesser Goldfinch | *Carduelis psaltria* | 30 | D, S, R, G |
| Lawrence's Goldfinch | *Carduelis lawrencei* | 2 | S |
| American Goldfinch | *Carduelis tristis* | 20 | R, G |
| **Passeridae** (Weaver Finches) | | | |
| House Sparrow | *Passer domesticus* | 2 | D |

### MAMMALS

| | | | |
|---|---|---|---|
| **Leporidae** (Rabbits and Hares) | | | |
| Desert Cottontail | *Sylvilagus audubonii* | 2 | S, R, G |
| San Diego Black-tailed Jackrabbit | *Lepus californicus bennetii* | 1 | D |
| **Sciuridae** (Squirrels, Chipmunks, and Marmots) | | | |
| California Ground Squirrel | *Spermophilus beecheyi* | 4 | D, R, G |
| **Geomyidae** (Pocket Gophers) | | | |
| Botta's Pocket Gopher | *Thomomys bottae* | Burrows | |